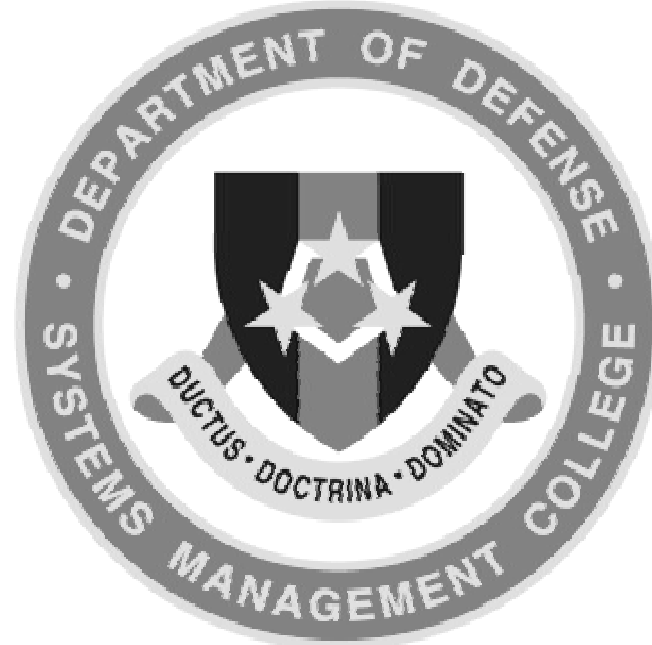




**And a Great Afternoon to You All**

Report Documentation Page		
<b>Report Date</b> 26032001	<b>Report Type</b> N/A	<b>Dates Covered (from... to)</b> -
<b>Title and Subtitle</b> Earned Value Management as an Implementation Tool for CAIV	<b>Contract Number</b>	
	<b>Grant Number</b>	
	<b>Program Element Number</b>	
<b>Author(s)</b> Bohls, Sr., Robert J.	<b>Project Number</b>	
	<b>Task Number</b>	
	<b>Work Unit Number</b>	
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<b>Sponsoring/Monitoring Agency Name(s) and Address(es)</b> NDIA (National Defense Industrial Association 2111 Wilson Blvd., Ste. 400 Arlington, VA 22201-3061	<b>Sponsor/Monitor's Acronym(s)</b>	
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<b>Classification of Abstract</b> unclassified	<b>Limitation of Abstract</b> UU	
<b>Number of Pages</b> 65		

# Earned Value Management as an Implementation Tool for CAIV



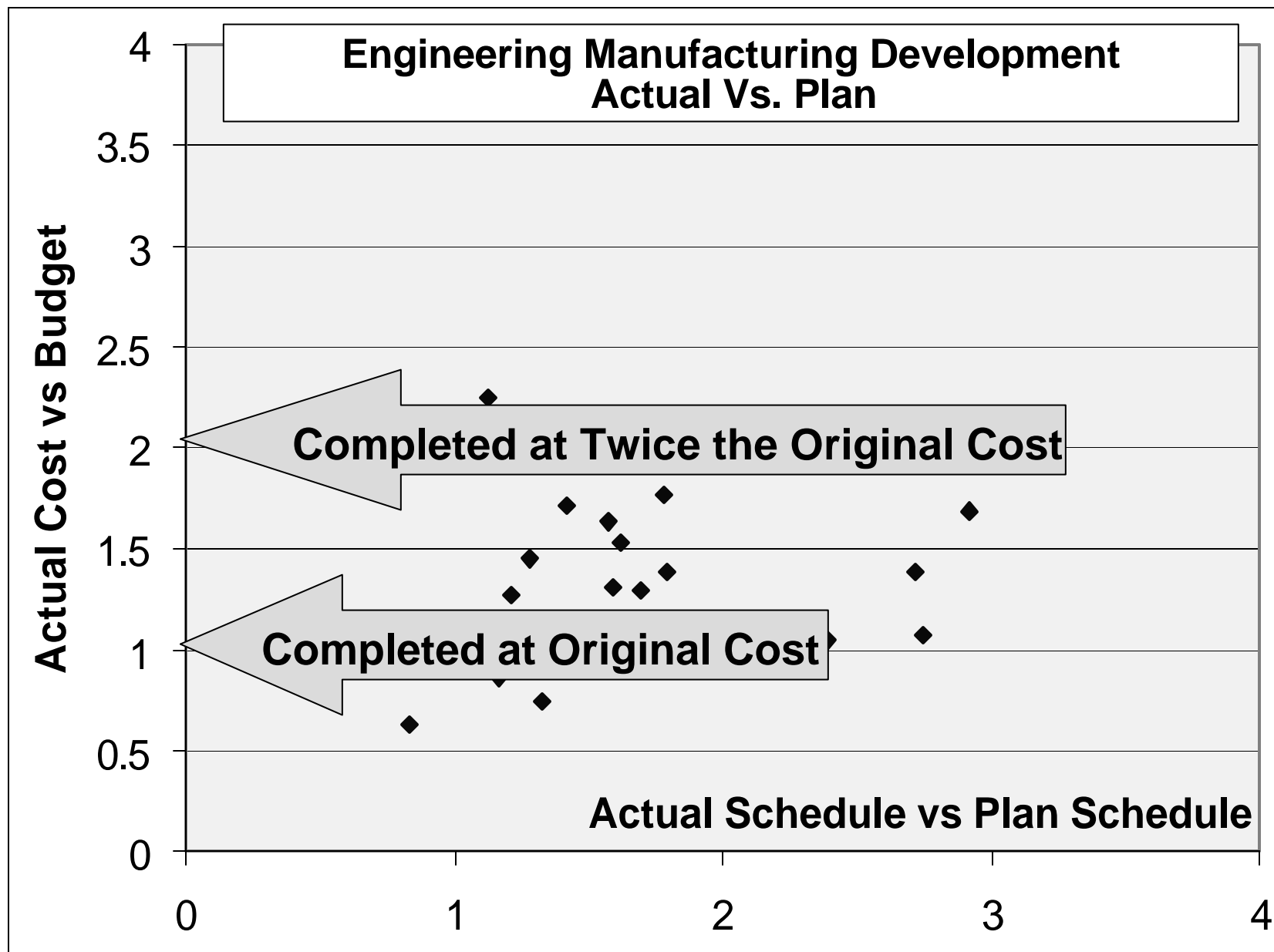
**Professor Robert J. Bohls Sr.**

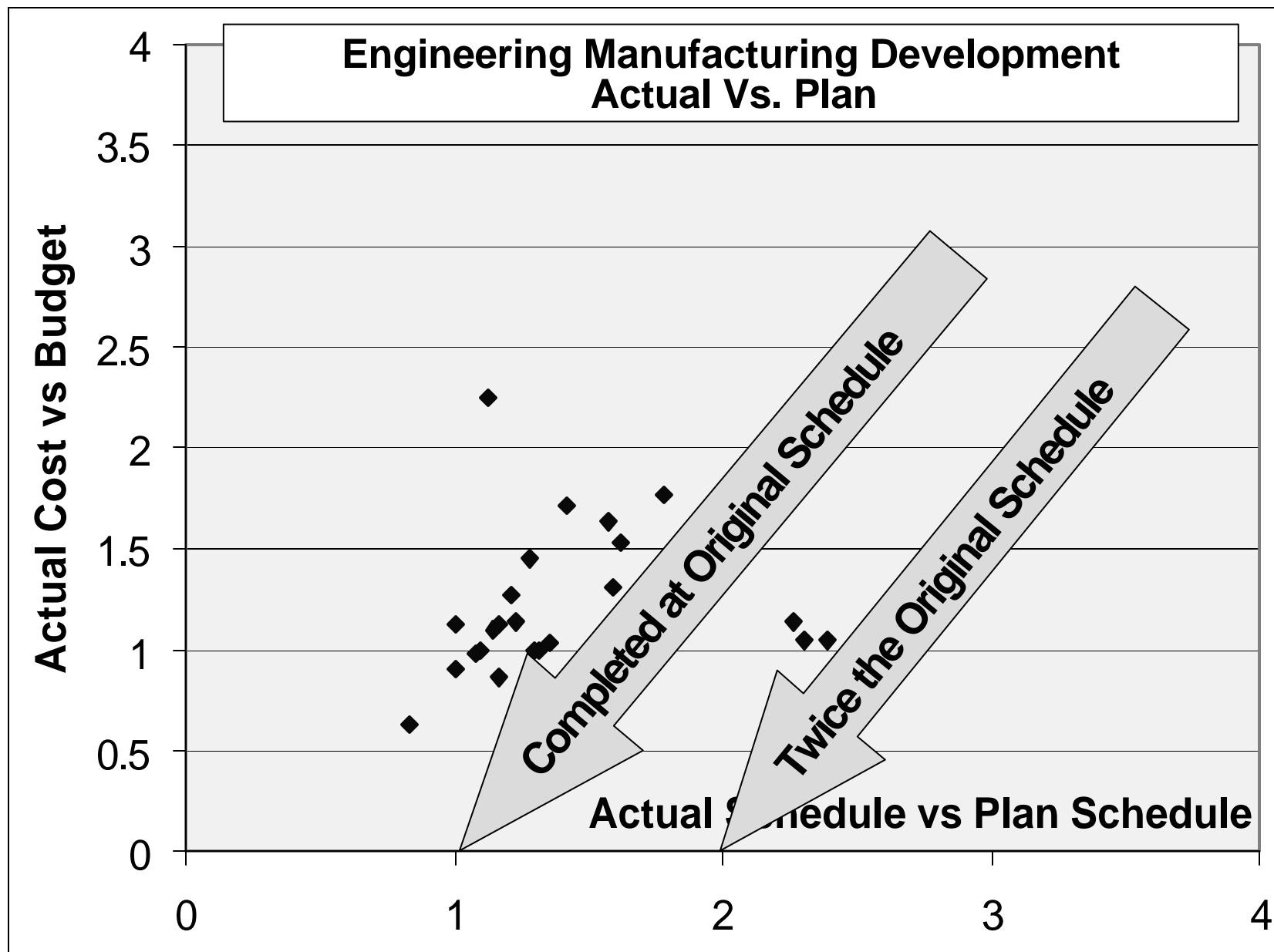
Department Chair, Earned Value Management  
robert.bohls@dau.mil  
703.805.3599

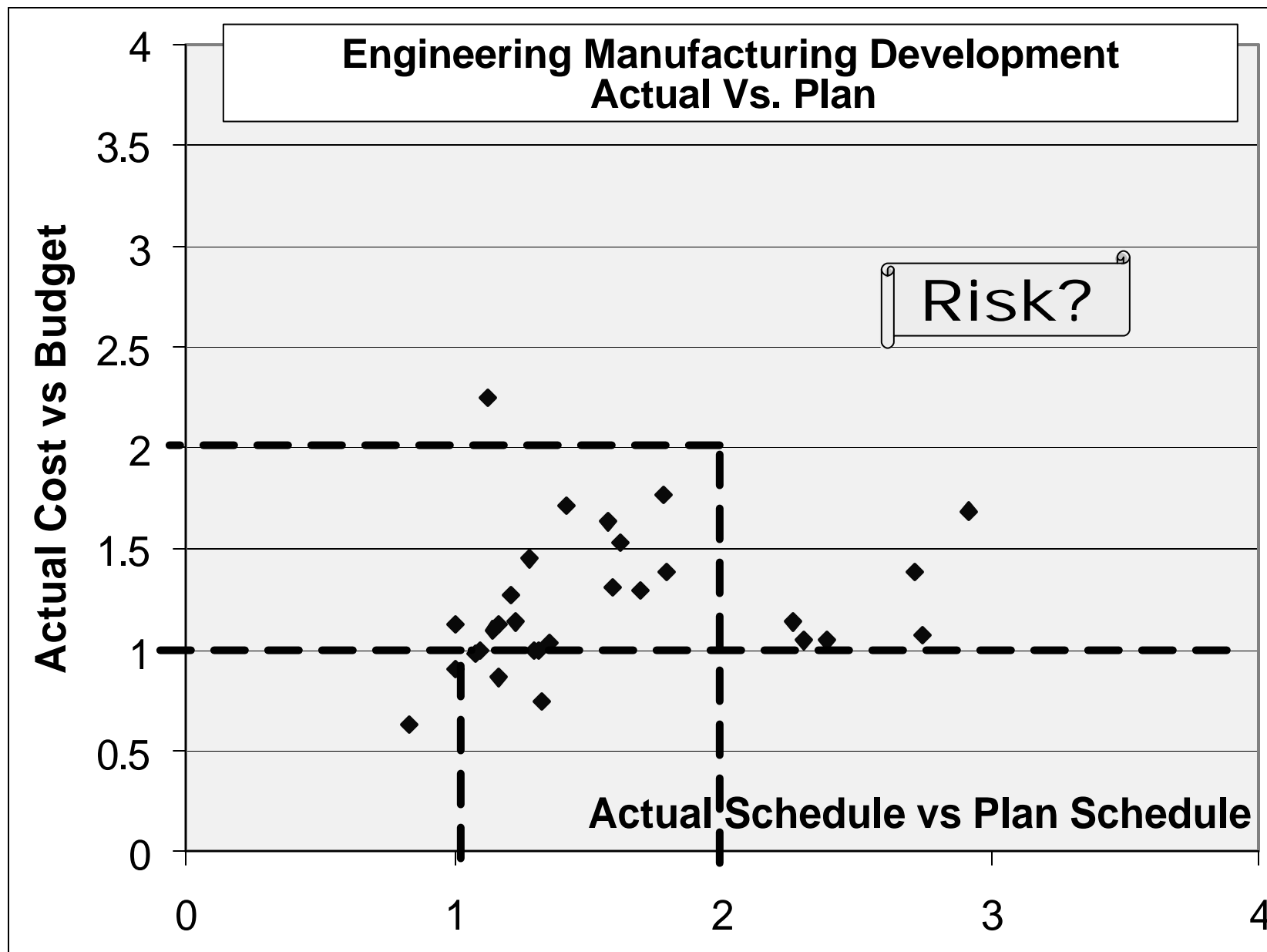
# Objectives

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- **Program Risk**
- **Cost as an Independent Variable**
- **Generally Accepted Management Principles**
- **Management Principle's Myths**

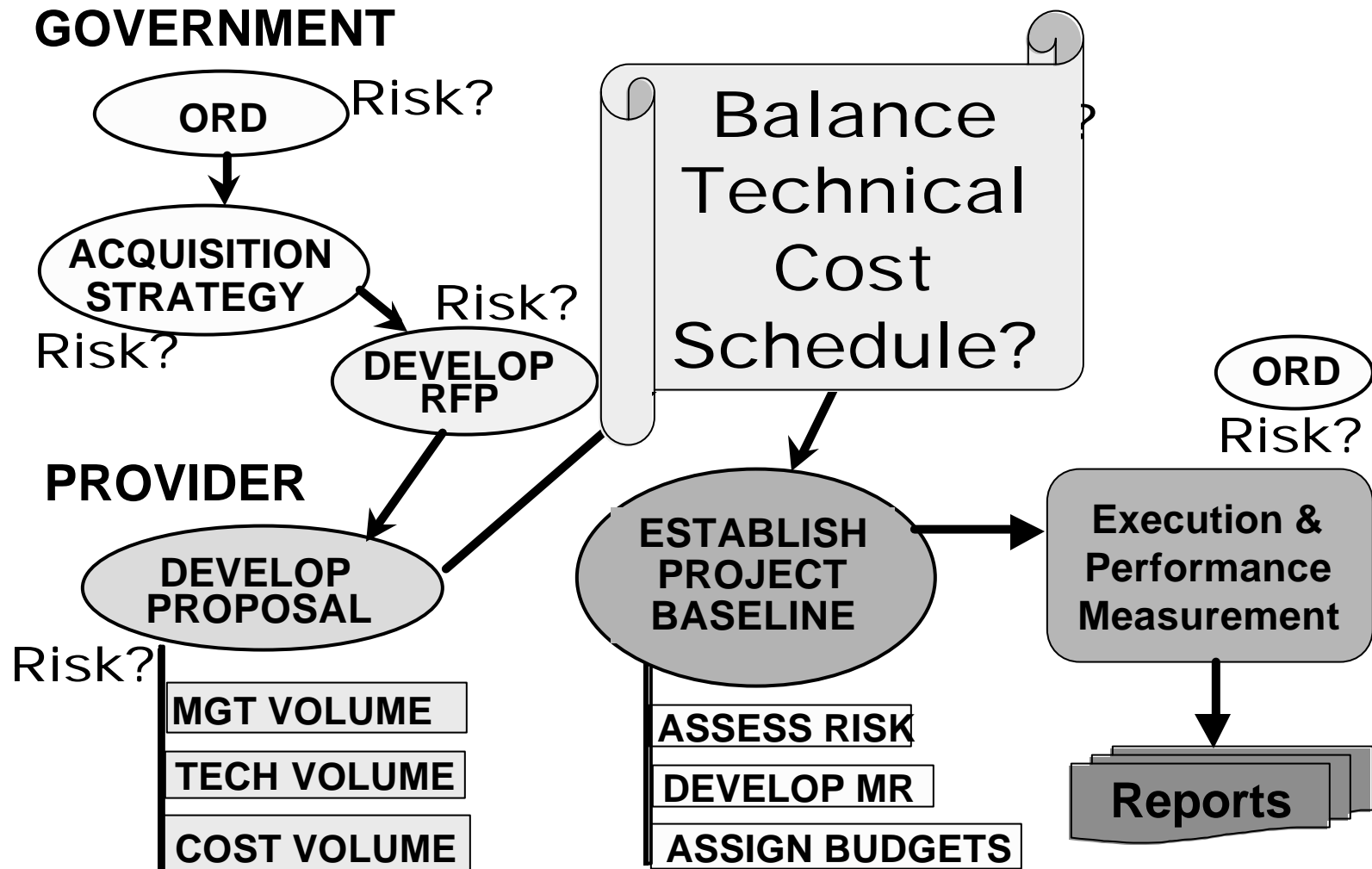






# Risk Introduced into the Program

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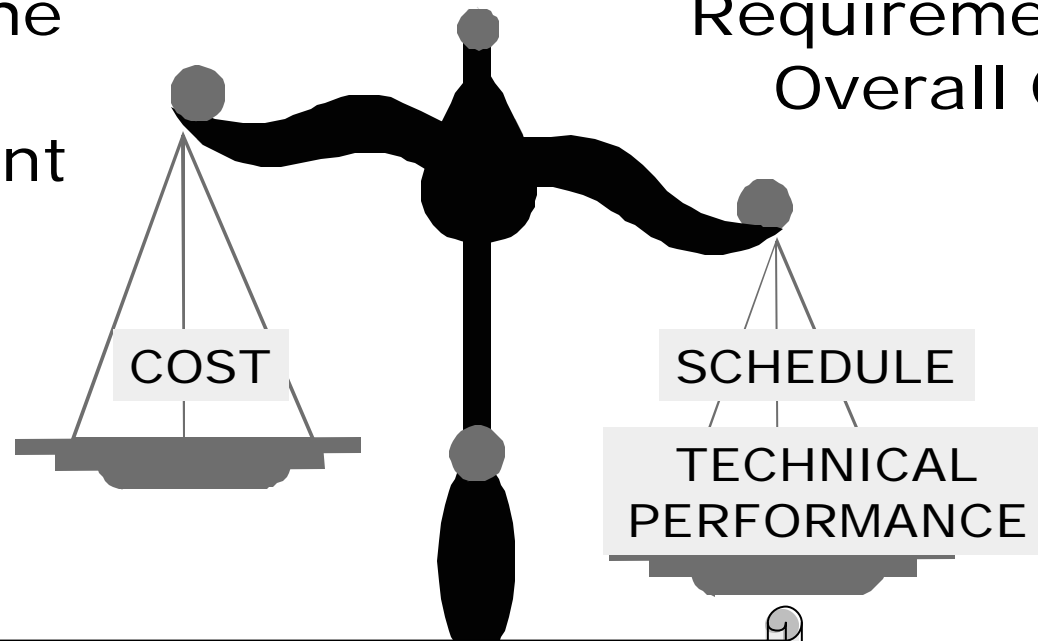


## Cost As the Independent Variable PM Balancing Act

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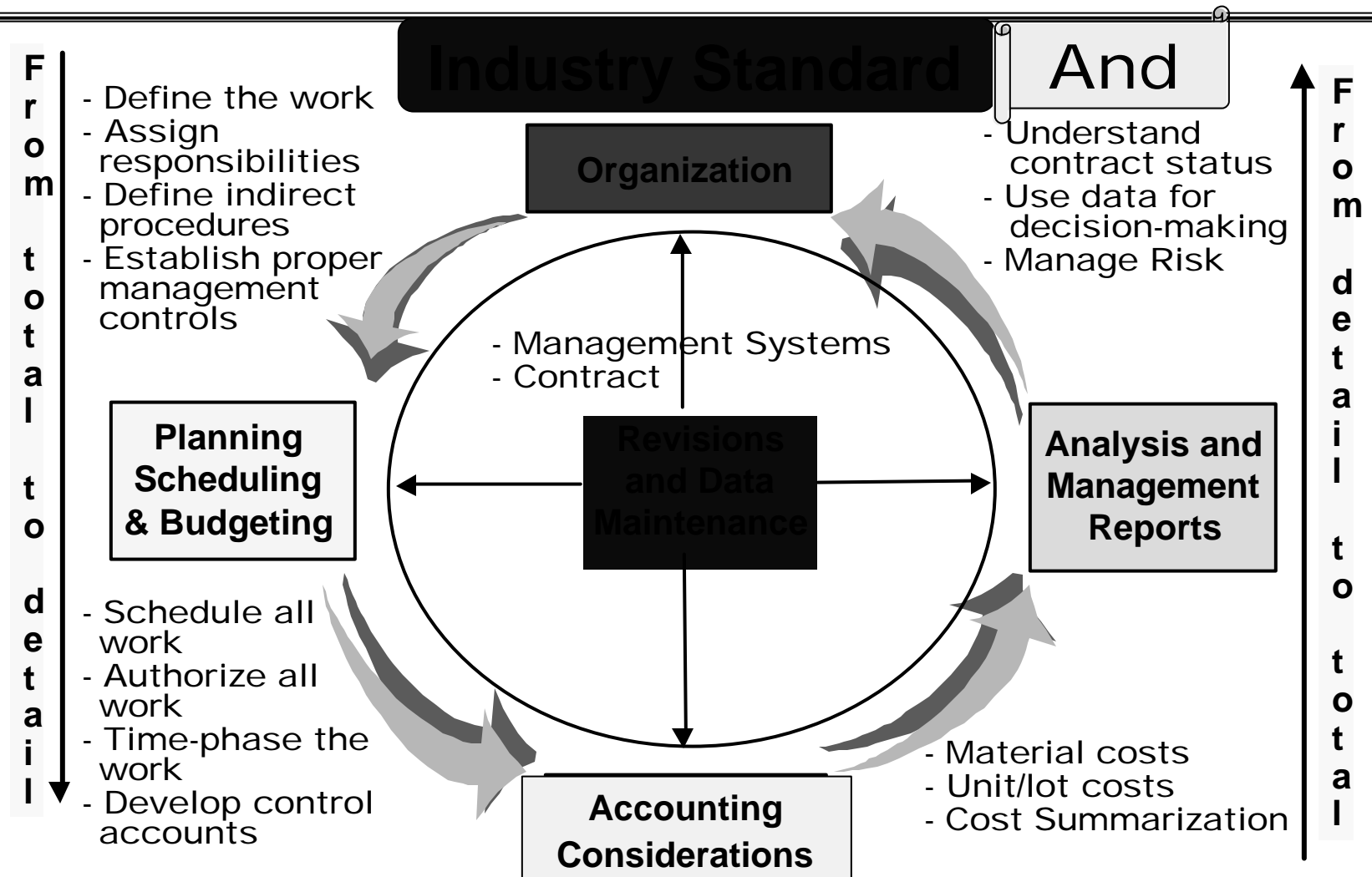
Produce the  
Best Product  
within the  
Cost  
Constraint

Must be willing to  
Trade  
Requirements for  
Overall Cost

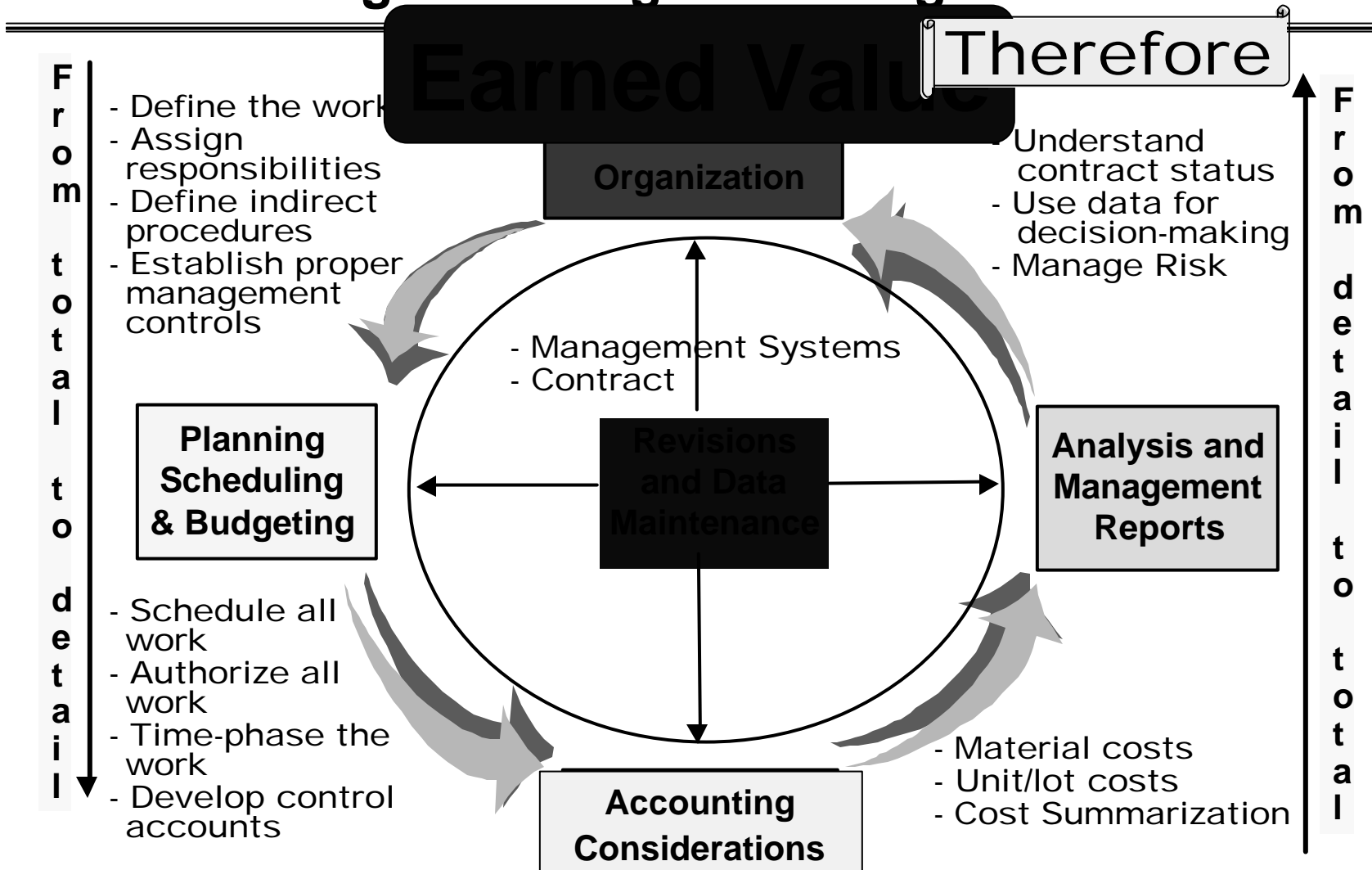


Generally Accepted  
Management Principles?

# Integrated Program Management



# Integrated Program Management



## Cost As the Independent Variable PM Balancing Act

---

Produce the  
Best Product  
within the  
Cost  
Constraint

Must be willing to  
Trade  
Requirements for  
Overall Cost

EVM Implements CAIV

COST

SCHEDULE

Myths?

TECHNICAL  
PERFORMANCE

If the CAIV Thresholds have Not been Met,  
the Design is Not Complete.

## **Myths of EVM**

---

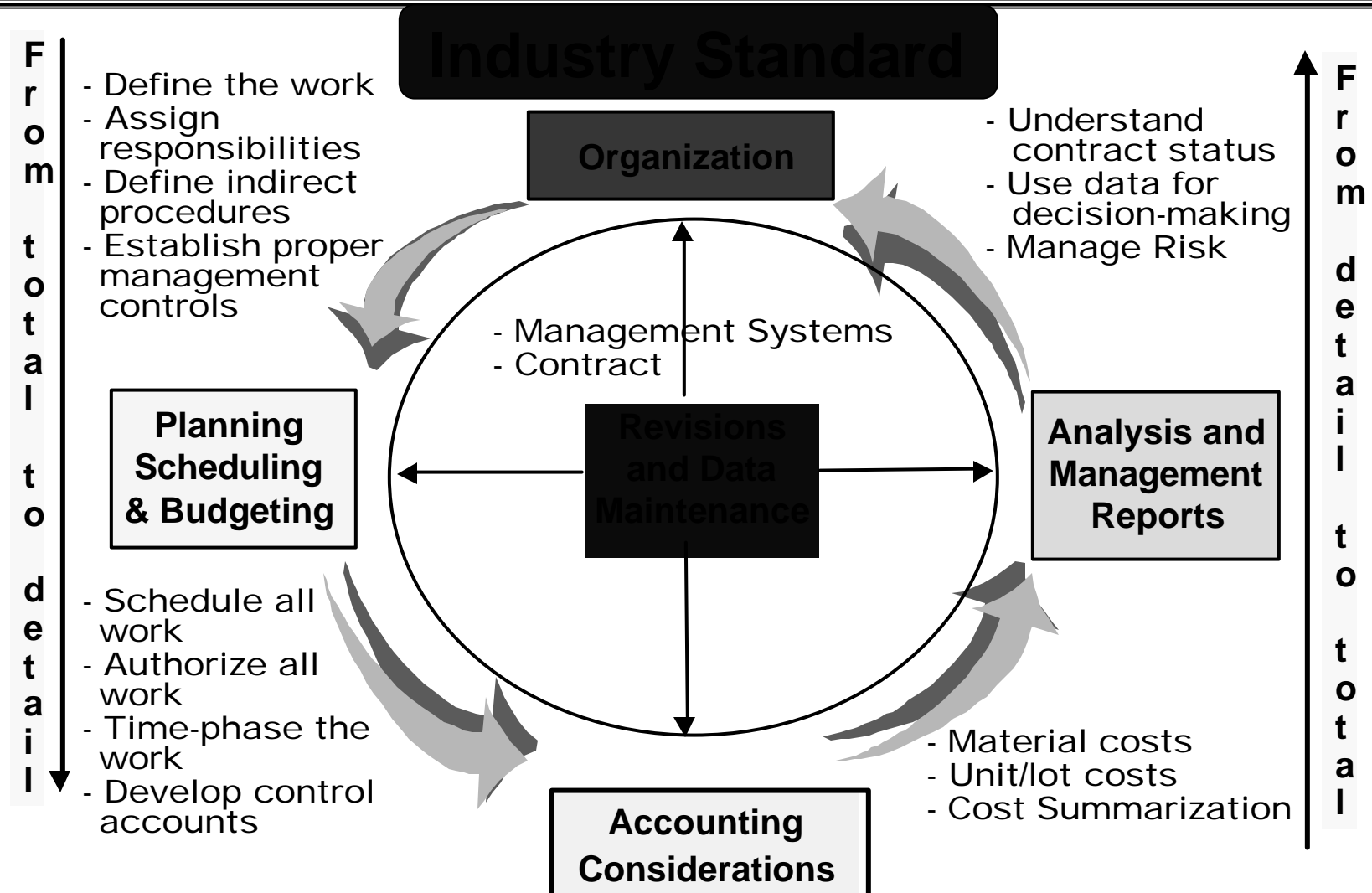
- **Its not the way we manage**
- **EVMS is a government reporting requirement**
- **Data is too old to use**
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- **Variances are bad**
- **Revising Baselines are Bad**
- **EVM costs too much**

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# Integrated Program Management



## **Myths of EVM**

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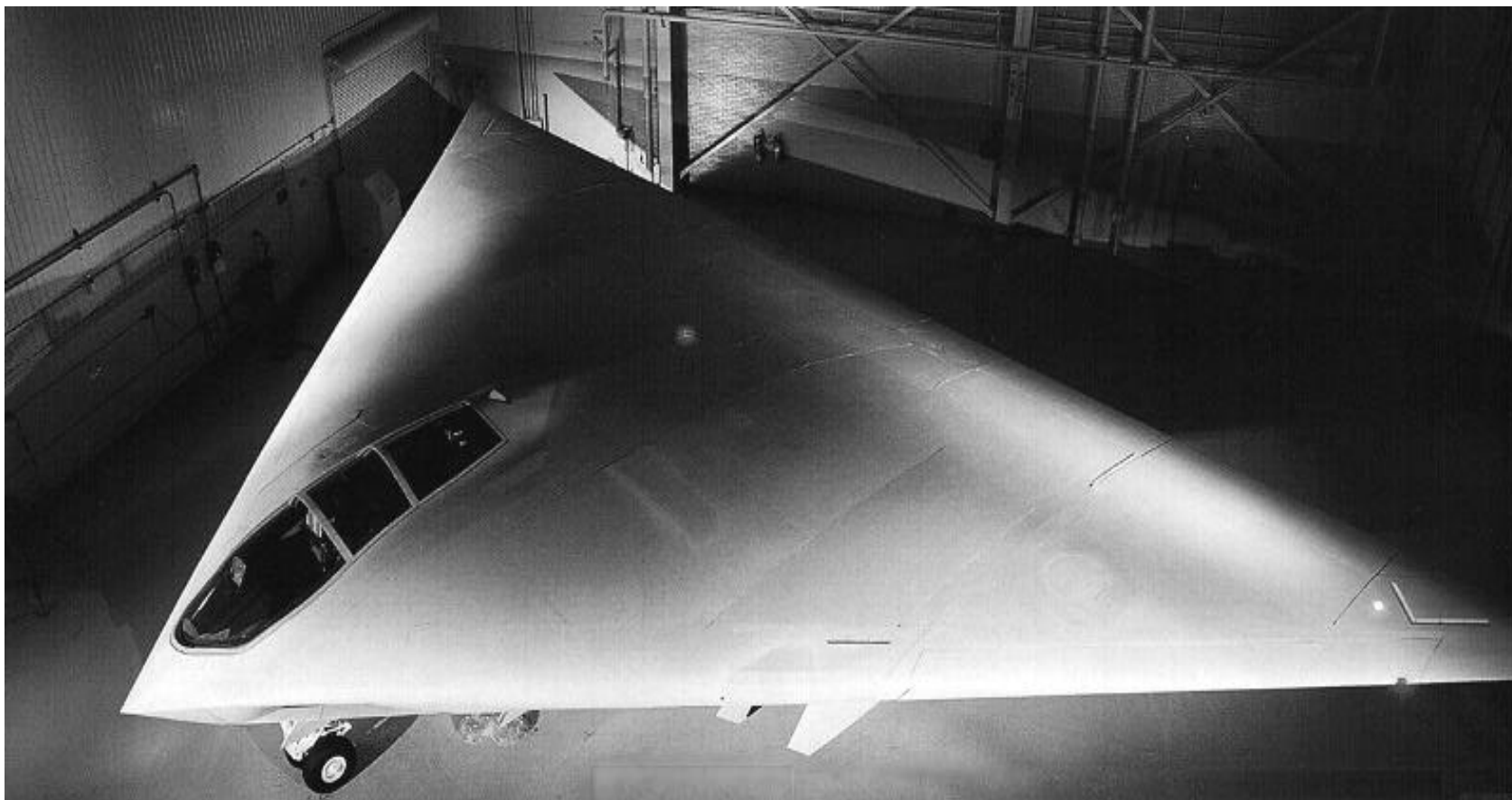
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# A-12

## The Plane That Never Was

---



## **A-12 Lesson Learned**

---

- **Too often, earned value insights remain the sole province of the supporting program control staff of both contractors and the government.**
  - **Earned value must be an integral part of the performing design and manufacturing organizations.**
  - **Only when program technical staffs are held accountable for earned value analysis, will they begin to understand its implications.**

**The “Beach” Report  
A-12 Administrative Inquiry  
28 Nov 1990**

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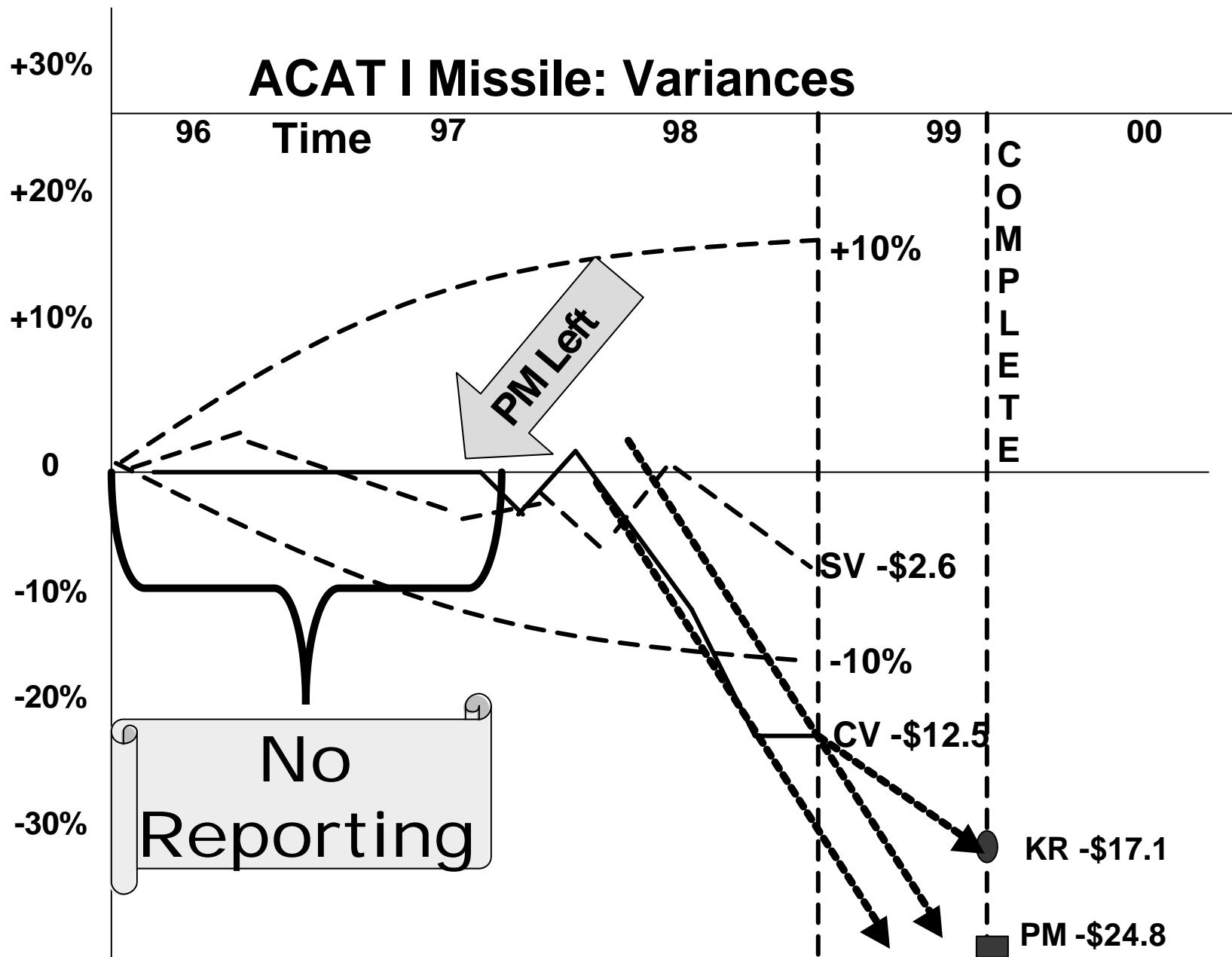
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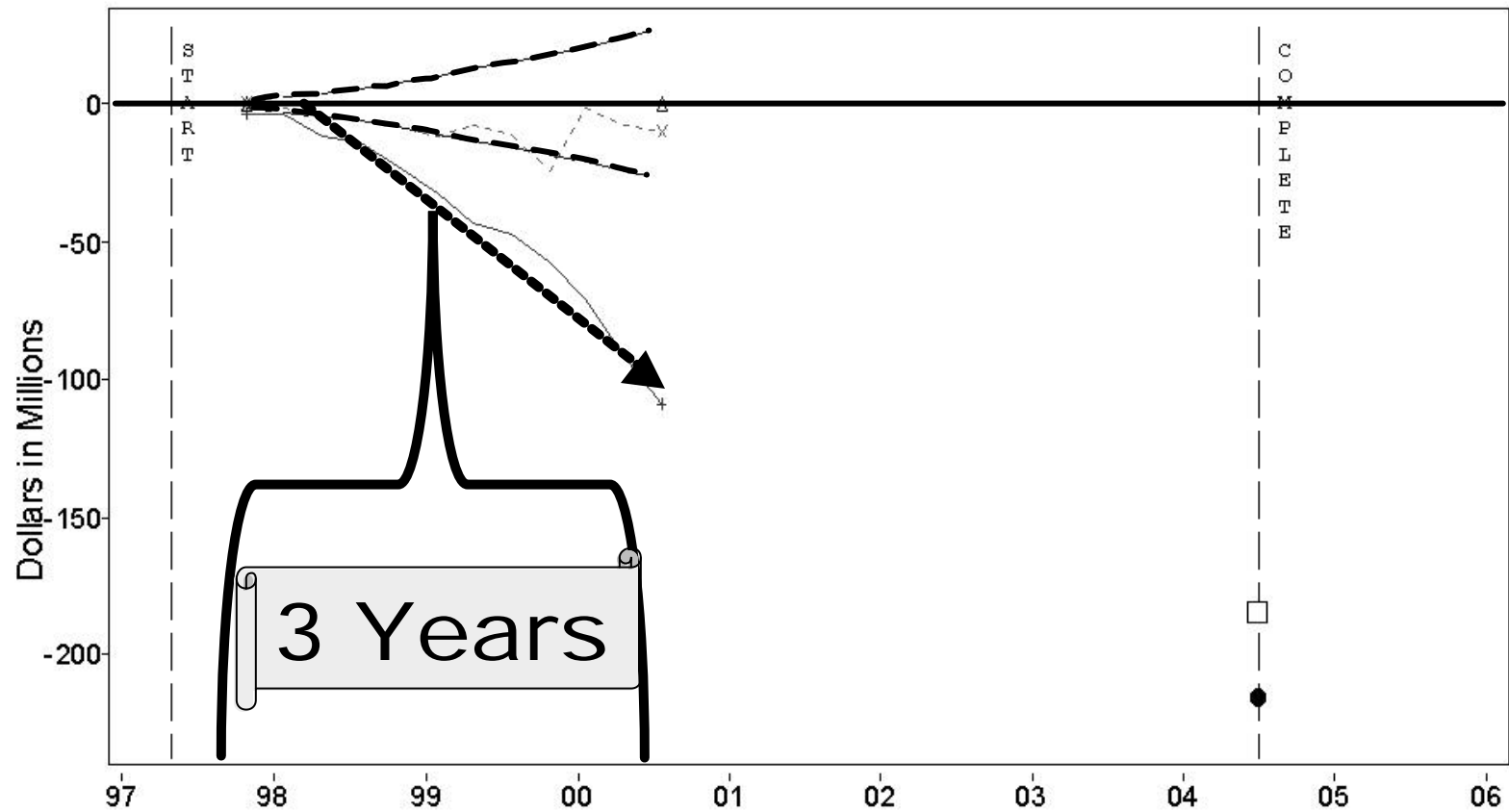
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# COST/SCHEDULE VARIANCE TRENDS

## Ship: Variances

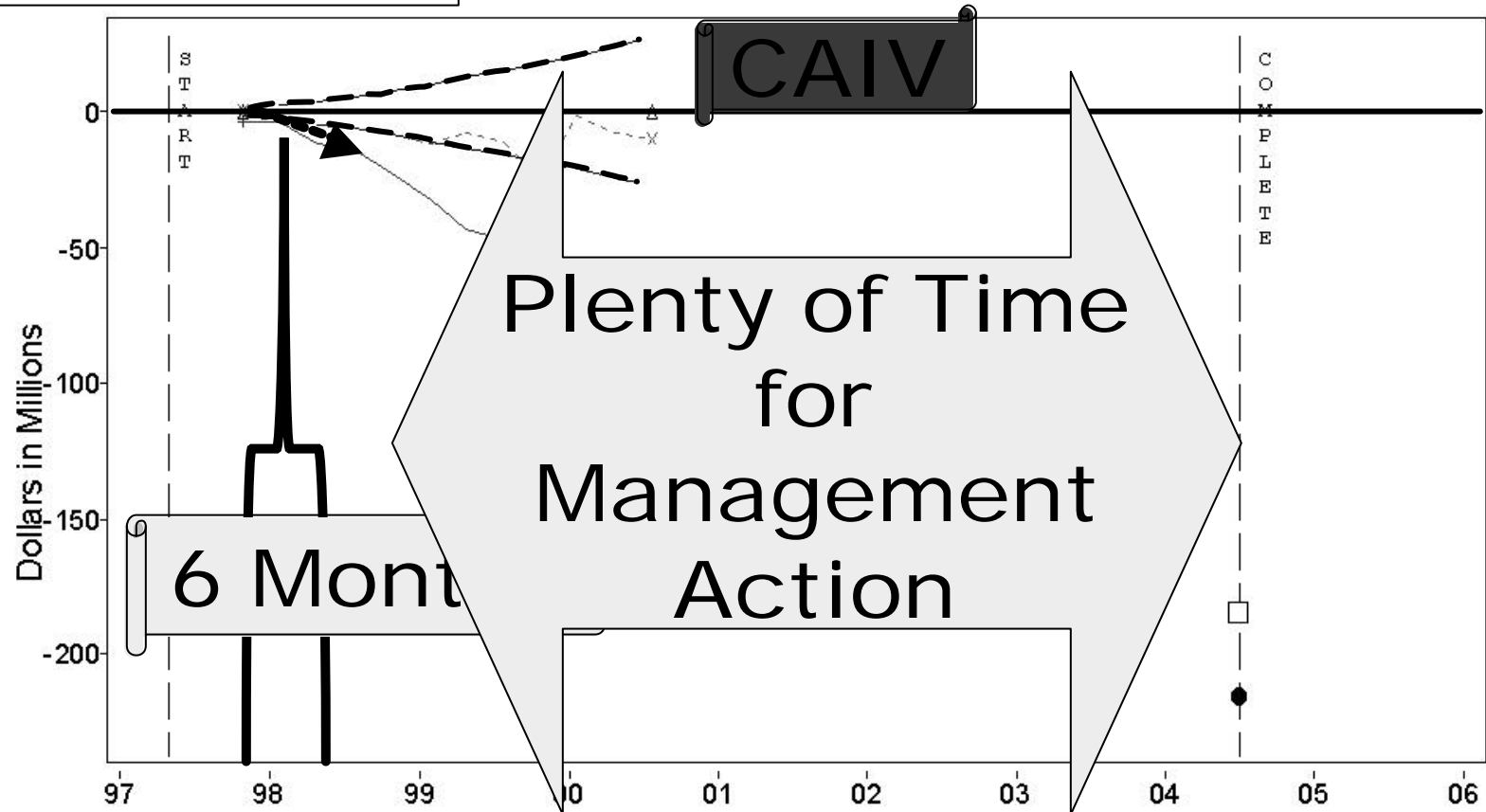


Cost Variance	— + —	-109.5	10% Thresholds	— — —	Cost Var @ Completion
Sched Variance	--- x ---	-9.7	Start/Comp Date	— — —	PM □ -185.0
Mgmt Reserve	- - Δ - -	0.0			CONTR ● -216.0



# COST/SCHEDULE VARIANCE TRENDS

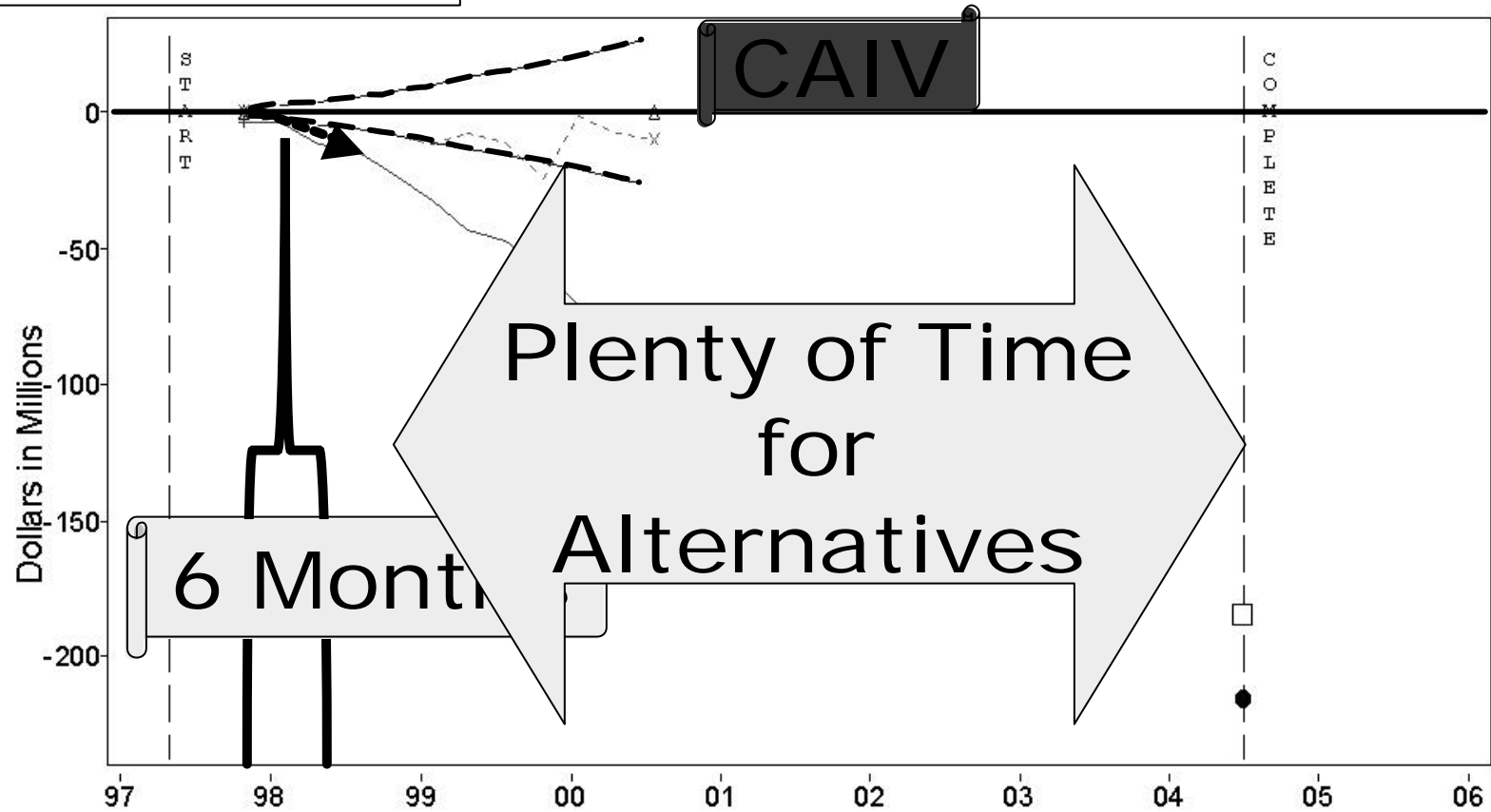
## Ship: Variances



Cost Variance	— + —	-109.5	10% Thresholds	— — —	Cost Var @ Completion
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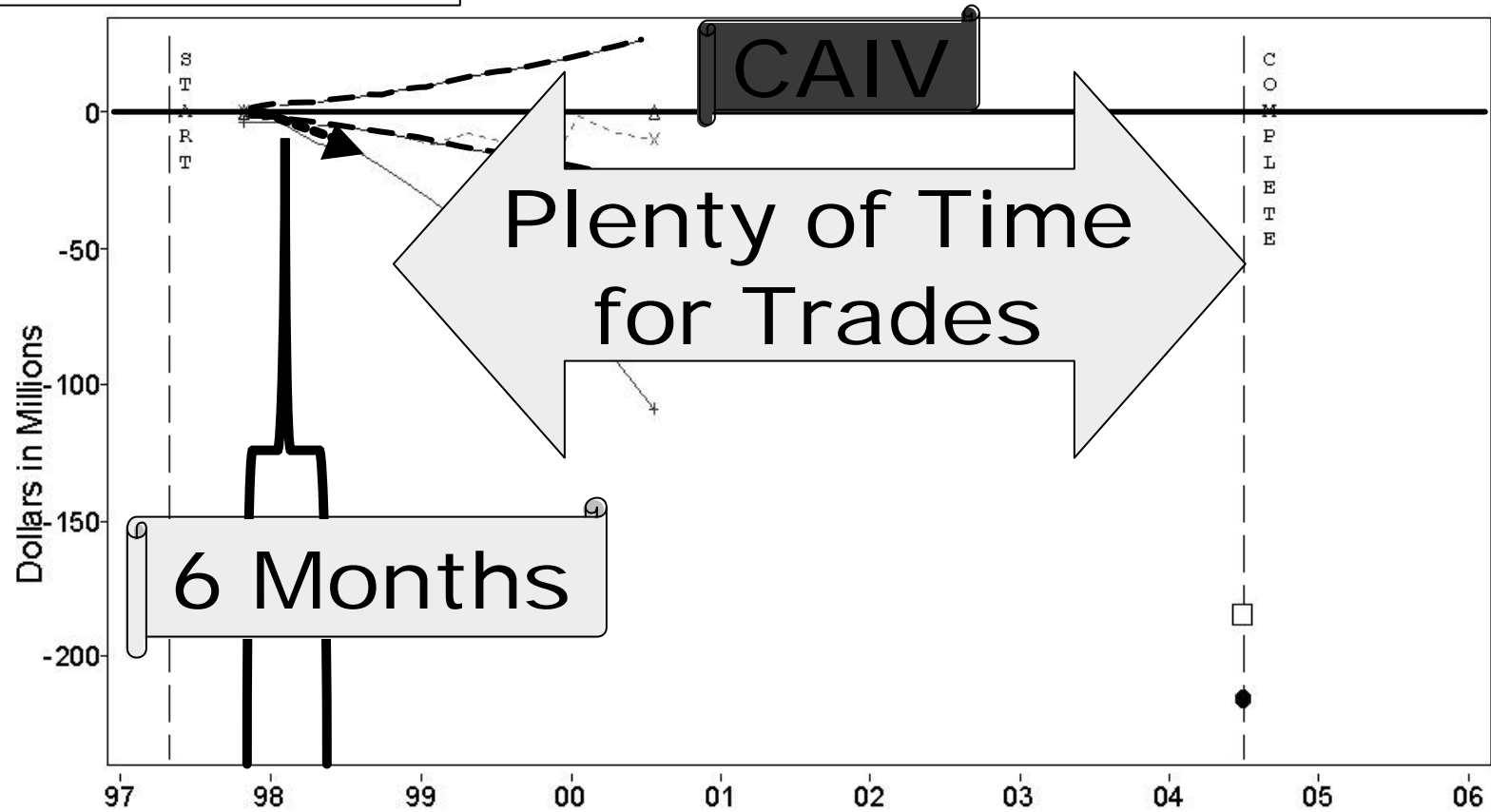
## Ship: Variances



Cost Variance	— + —	-109.5	10% Thresholds	— — —	Cost Var @ Completion
Sched Variance	--- x ---	-9.7	Start/Comp Date	— — —	PM □ -185.0
Mgmt Reserve	- - Δ - -	0.0			CONTR ● -216.0

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Sched Variance	--- x ---	-9.7	Start/Comp Date	————	PM □ -185.0
Mgmt Reserve	- - Δ - -	0.0			CONTR ● -216.0

# F/A 18 E/F Program

---



Trust

**Mike Sears:**



JSF

**“Weekly EVM reporting so team leaders have the results of their actions quickly.”**

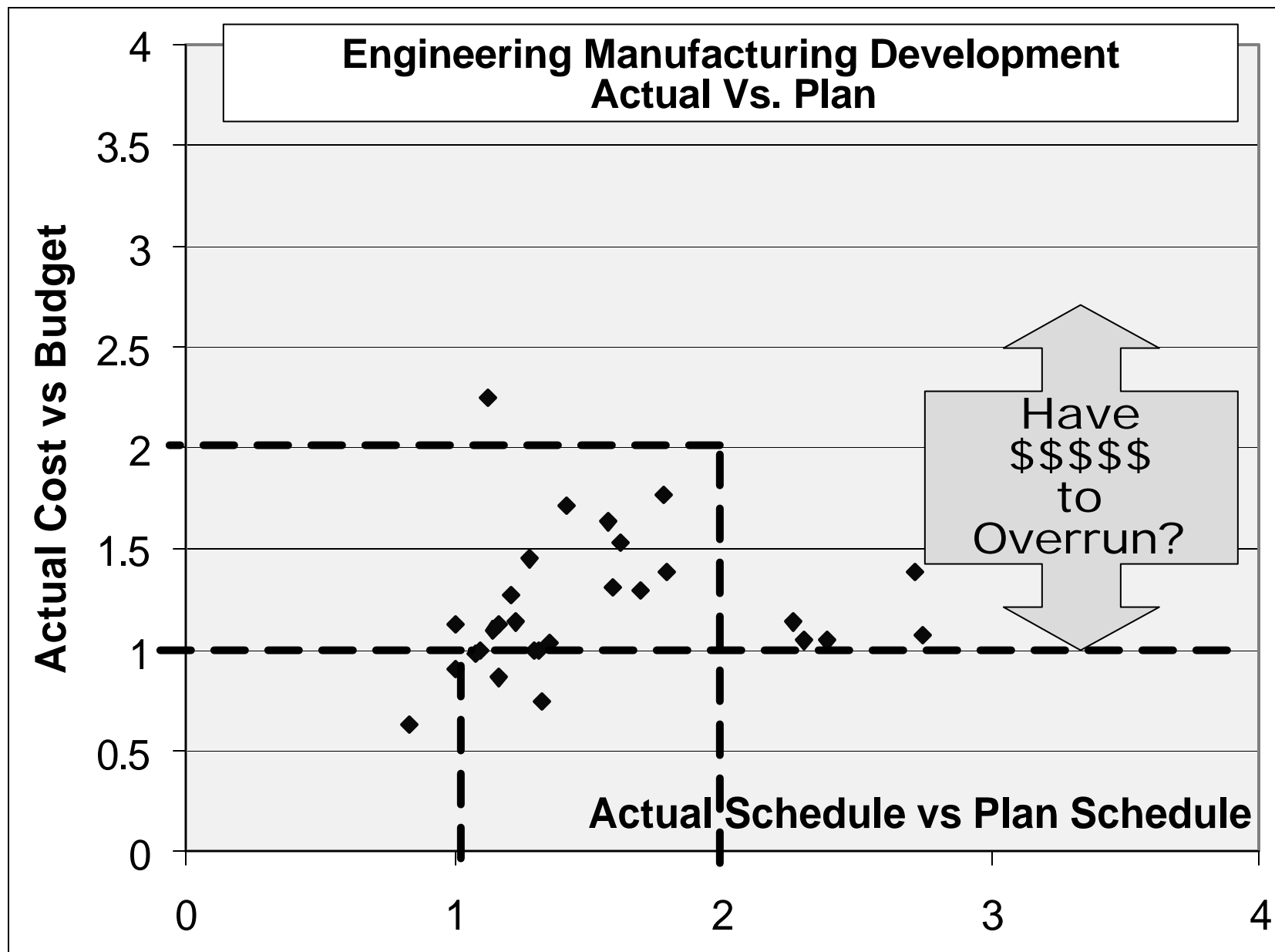
**“Technical people find detail planning extremely difficult, don’t like to do it. It is hard to do but it is absolutely essential to take that first step.”**

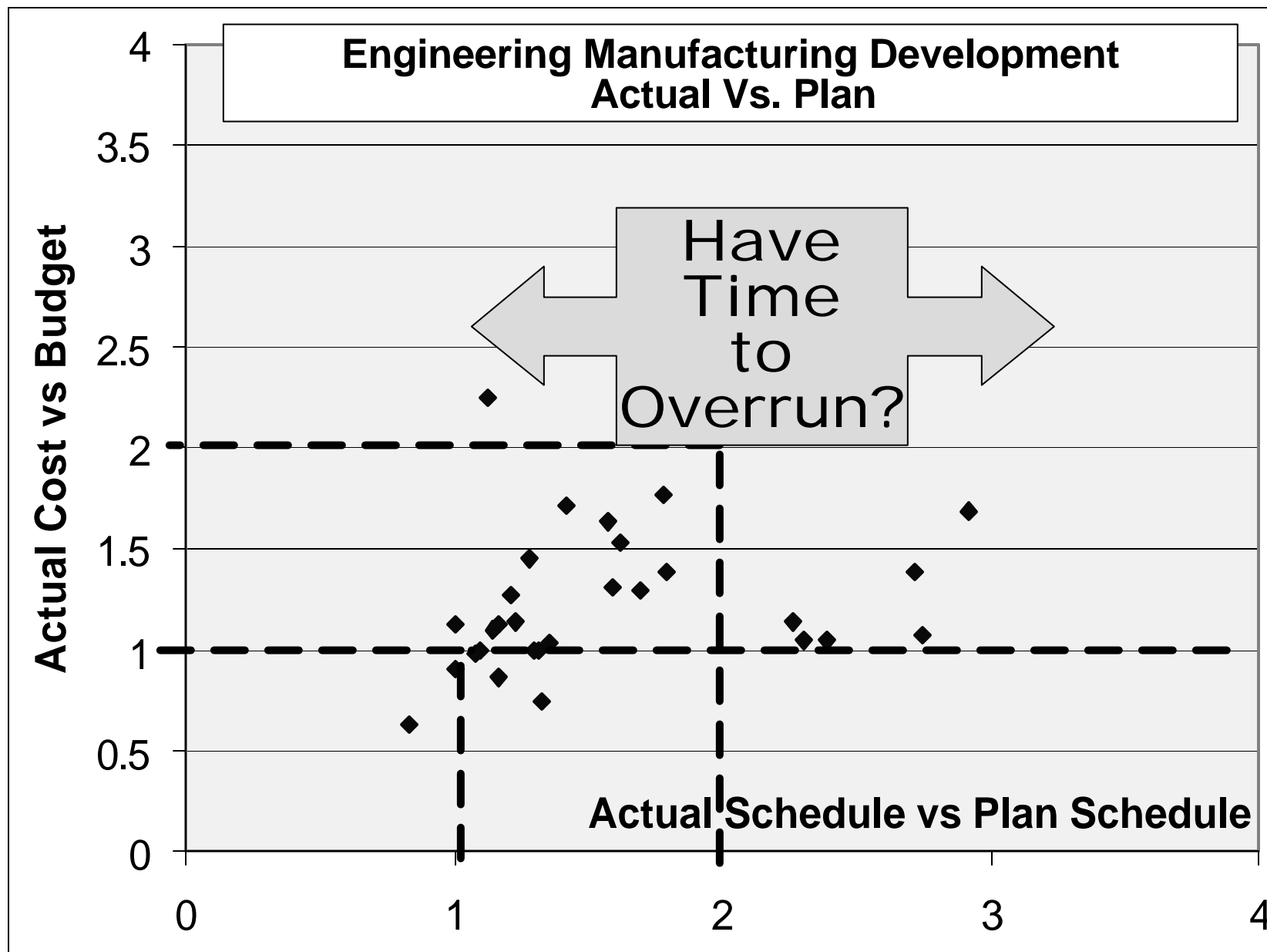
**“We don’t know all of the detail ahead of time. It is that learning process of pulling the plan together where you find lots of things that you never find if you don’t attack it at the detail level.”**

**President, McDonnell Douglas  
A12 Program**



Don't  
have  
Time?





## **Myths of EVM**

---

- **Its not the way we manage**
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- **Revising Baselines are Bad**
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## EAC - Futuristic Perspective:

---

- When a contract is more than 15% complete & more than 10% overrun:
  - 1. *The overrun at completion will be more than the overrun incurred to date*
  - 2. *The percent overrun at completion will be greater than percent overrun incurred to date*
- Based on OSD database of more than 500 major DOD contracts since 1977

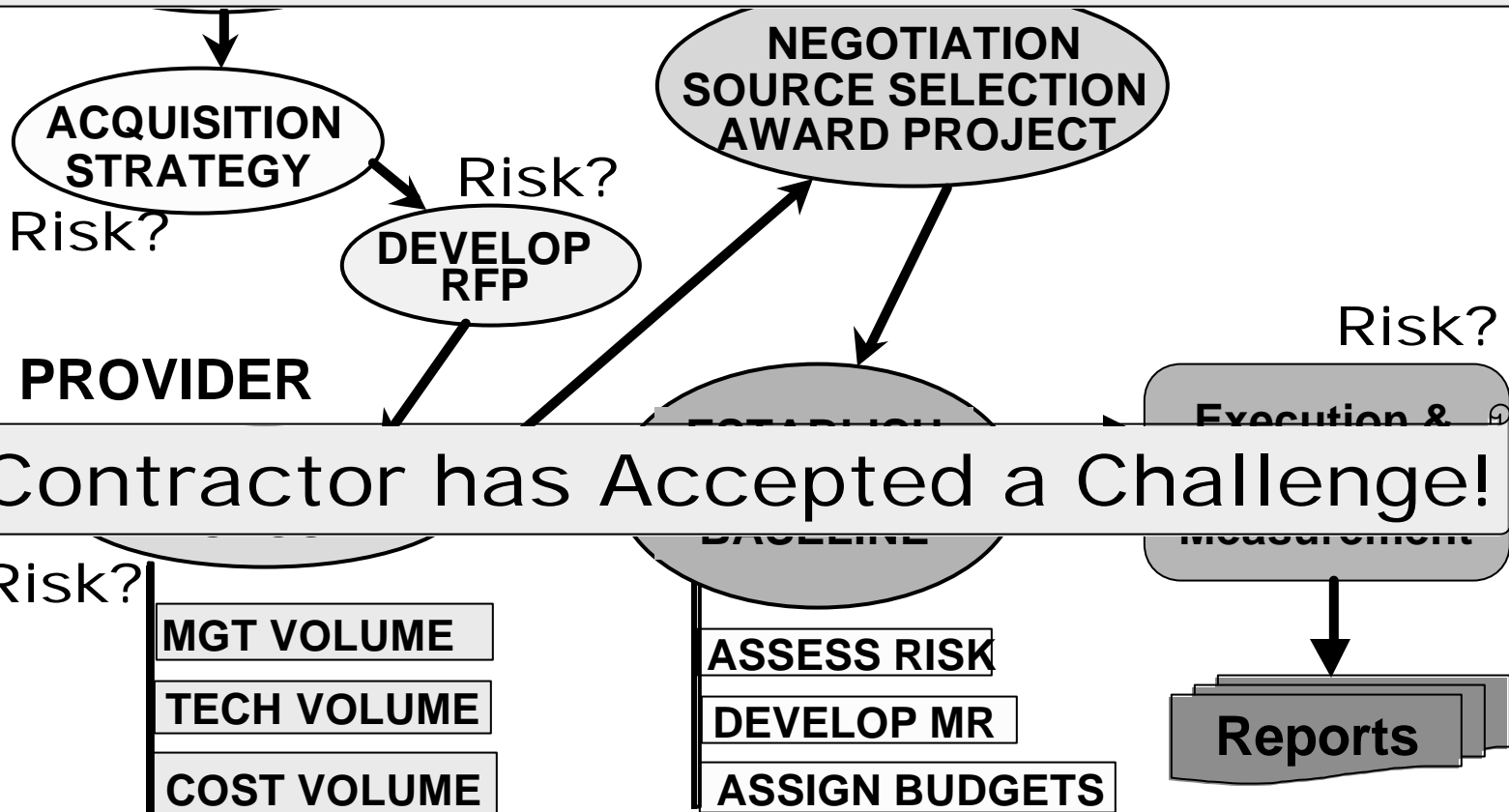
Why is this True?



# Risk Introduced into the Program

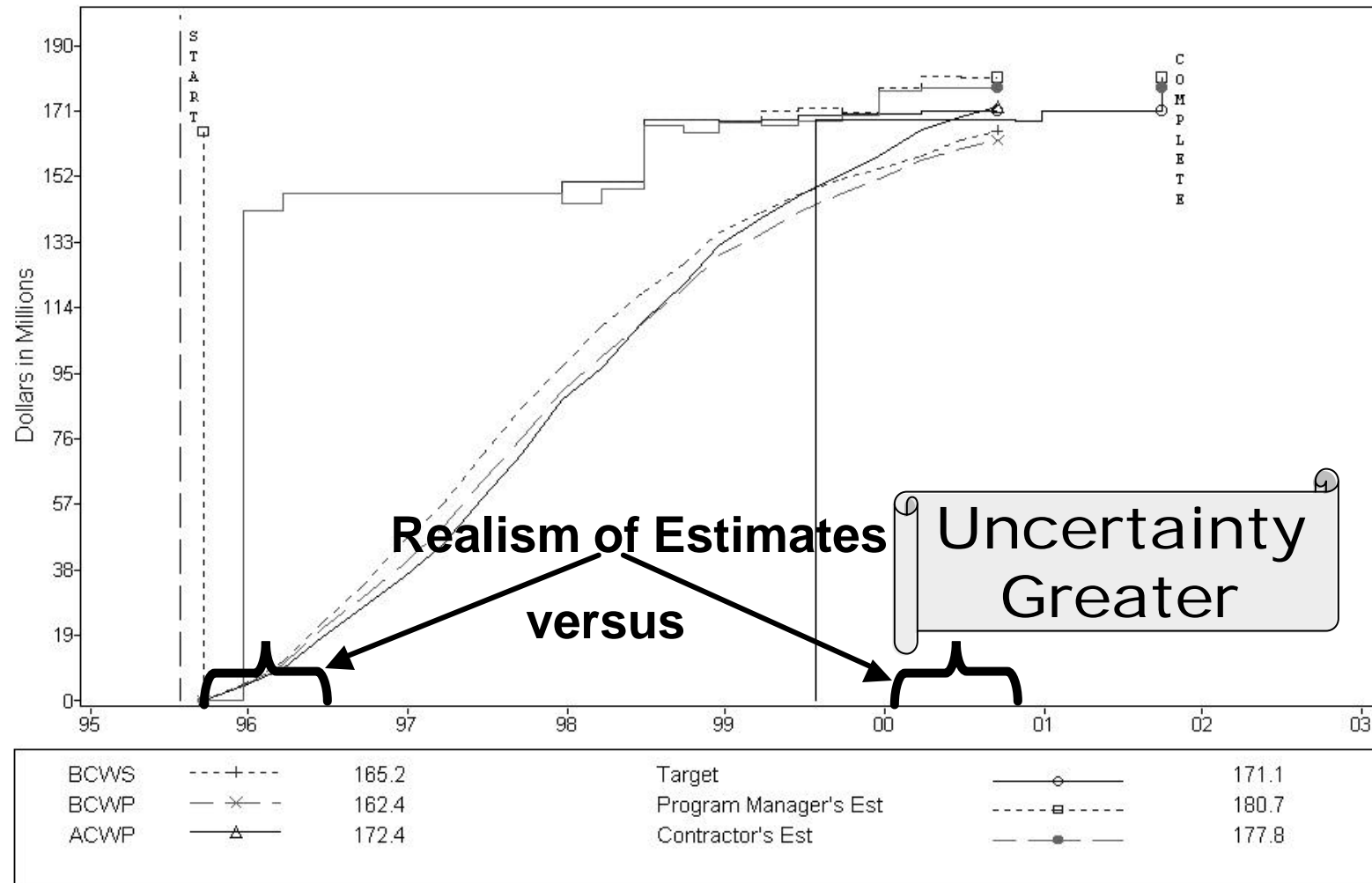
## GOVERNMENT

Government has Designed a Challenge!



# CONTRACT PERFORMANCE

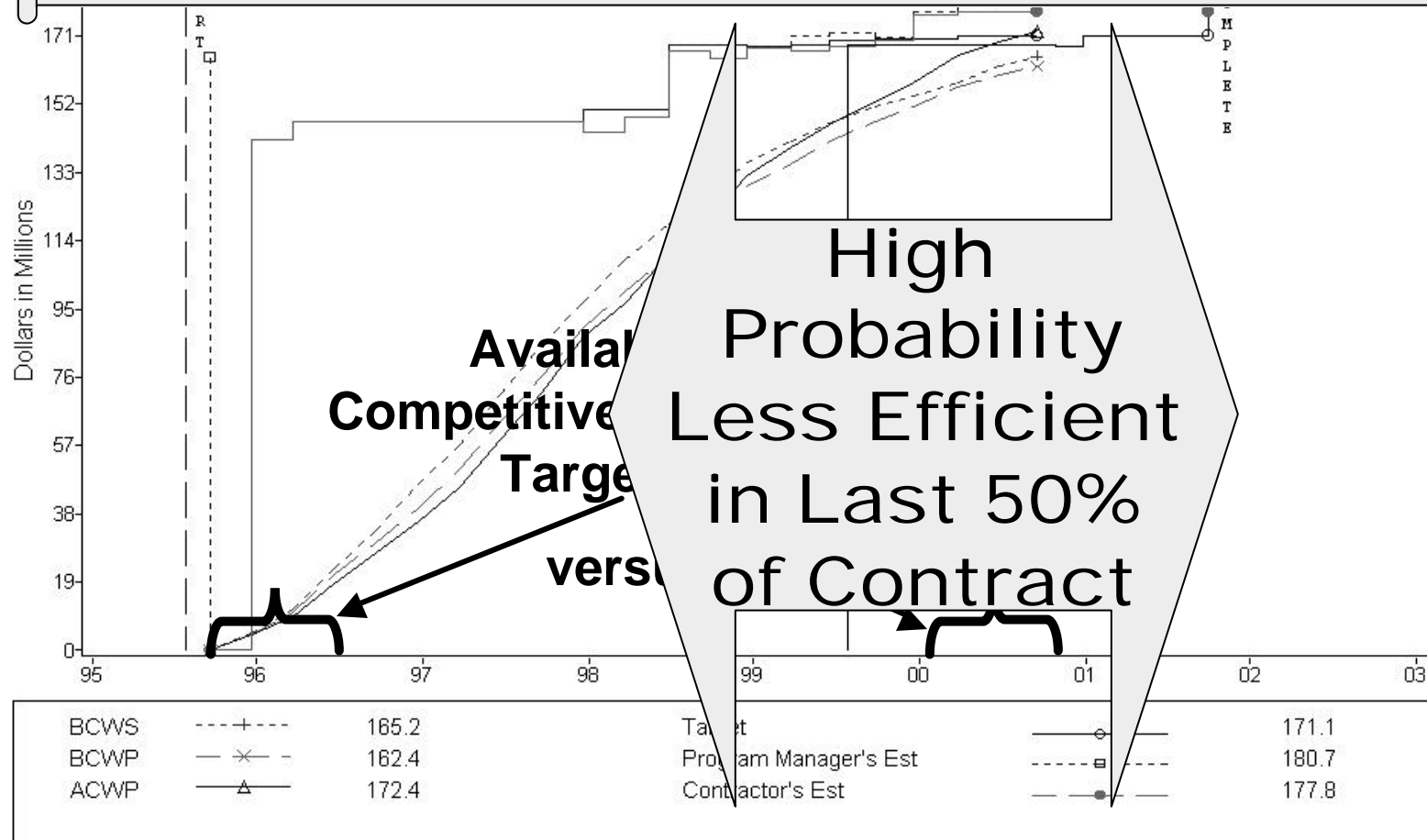
## Missile: PMB



## CONTRACT PERFORMANCE

Missile: PMB

# Contractor has Accepted a Challenge



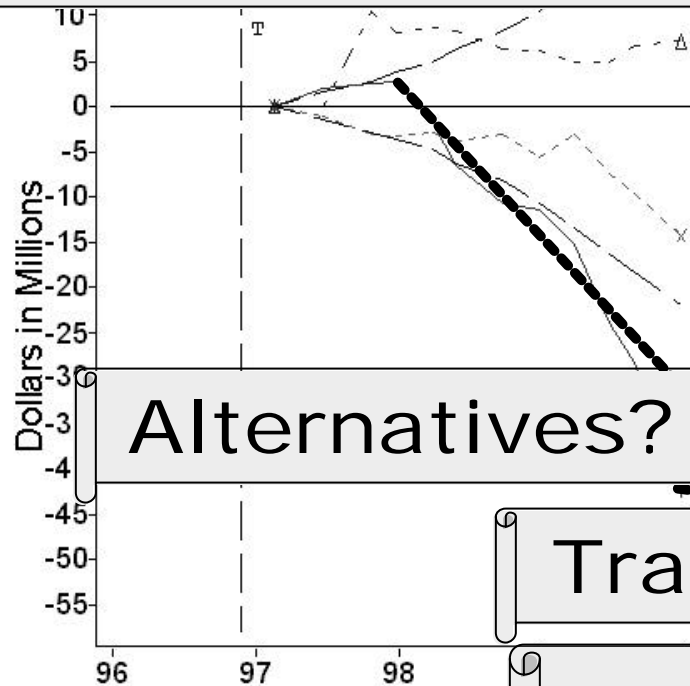
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# Helicopter: Variances

Don't Shoot the Messenger



Alternatives?

Trades?

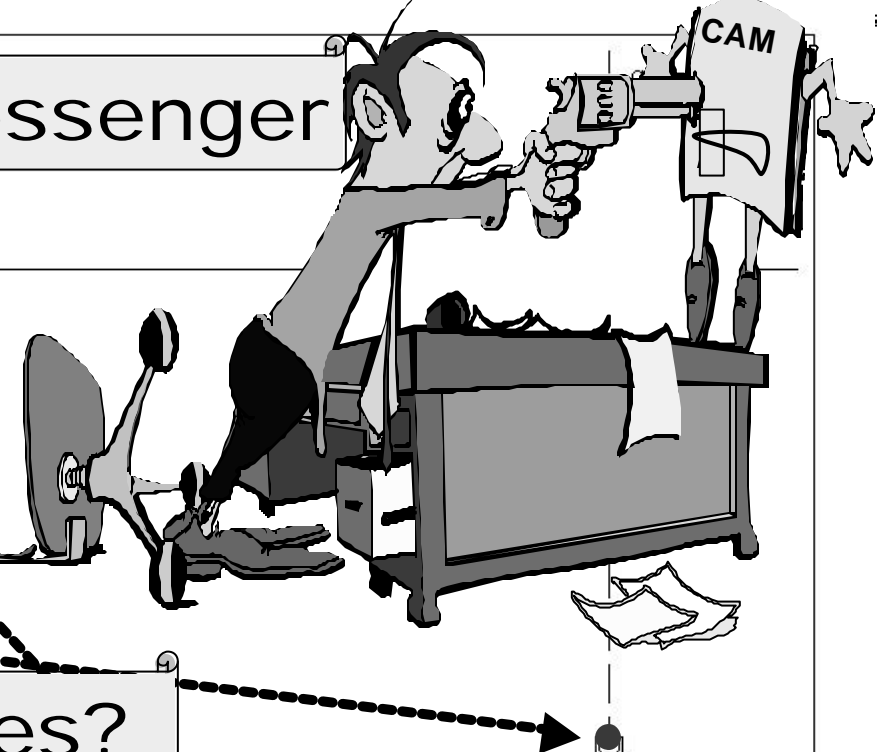
Responsible Management Decisions?

Cost Variance — + —  
Sched Variance - - - x - - -  
Mgmt Reserve - - - Δ - - -

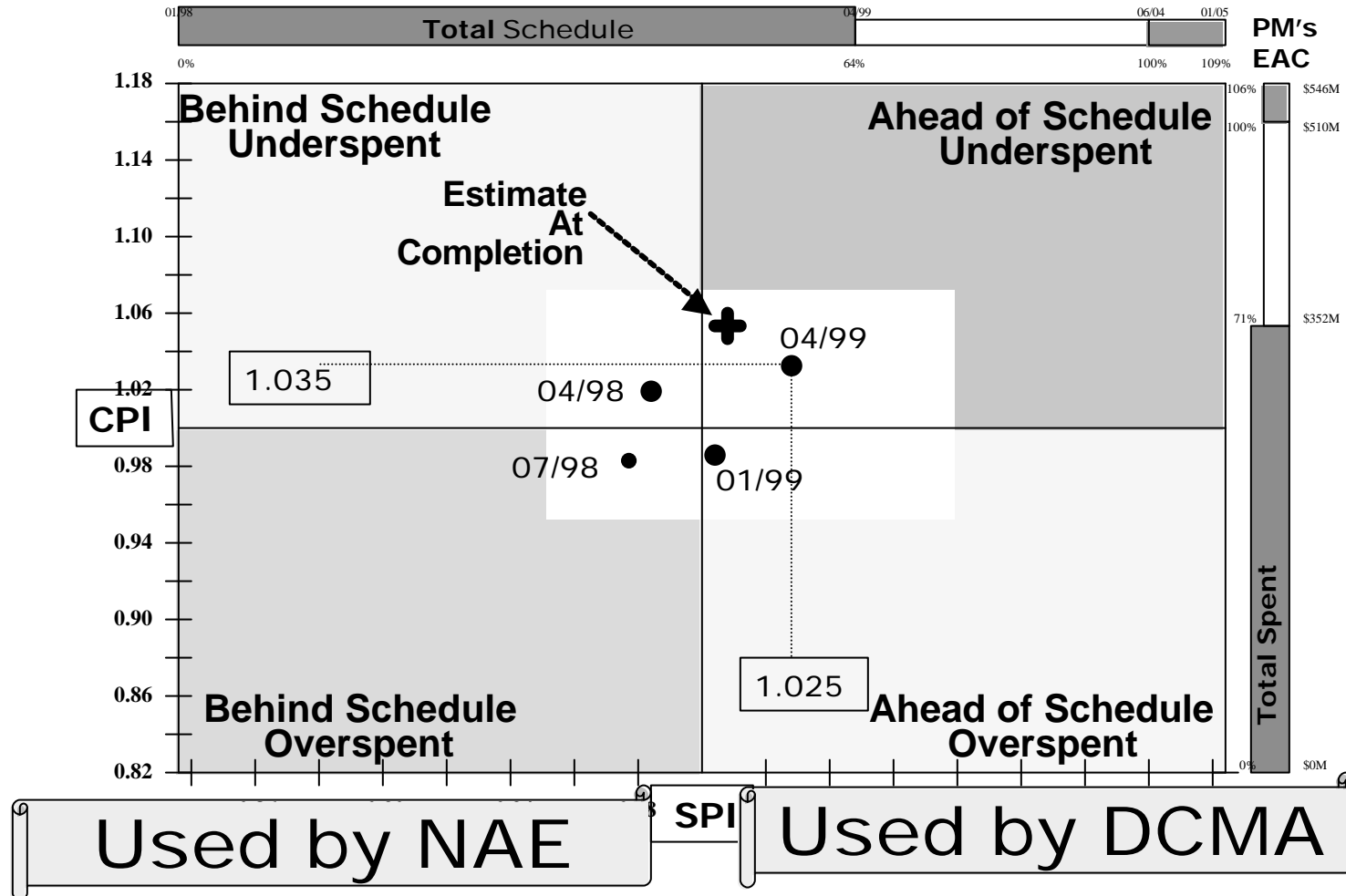
7.2 Start/Comp Date

CONTR ?

-52.7



# Performance Overview



## Cost As the Independent Variable PM Balancing Act

Produce the  
Best Product  
within the  
Cost  
Constr

Must be willing to  
Trade  
Requirements for  
Overall Cost

EVM Implements CAIV

COST

SCHEDULE

TECHNICAL  
PERFORMANCE

If the CAIV Thresholds have not been met,  
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## **Myths of EVM**

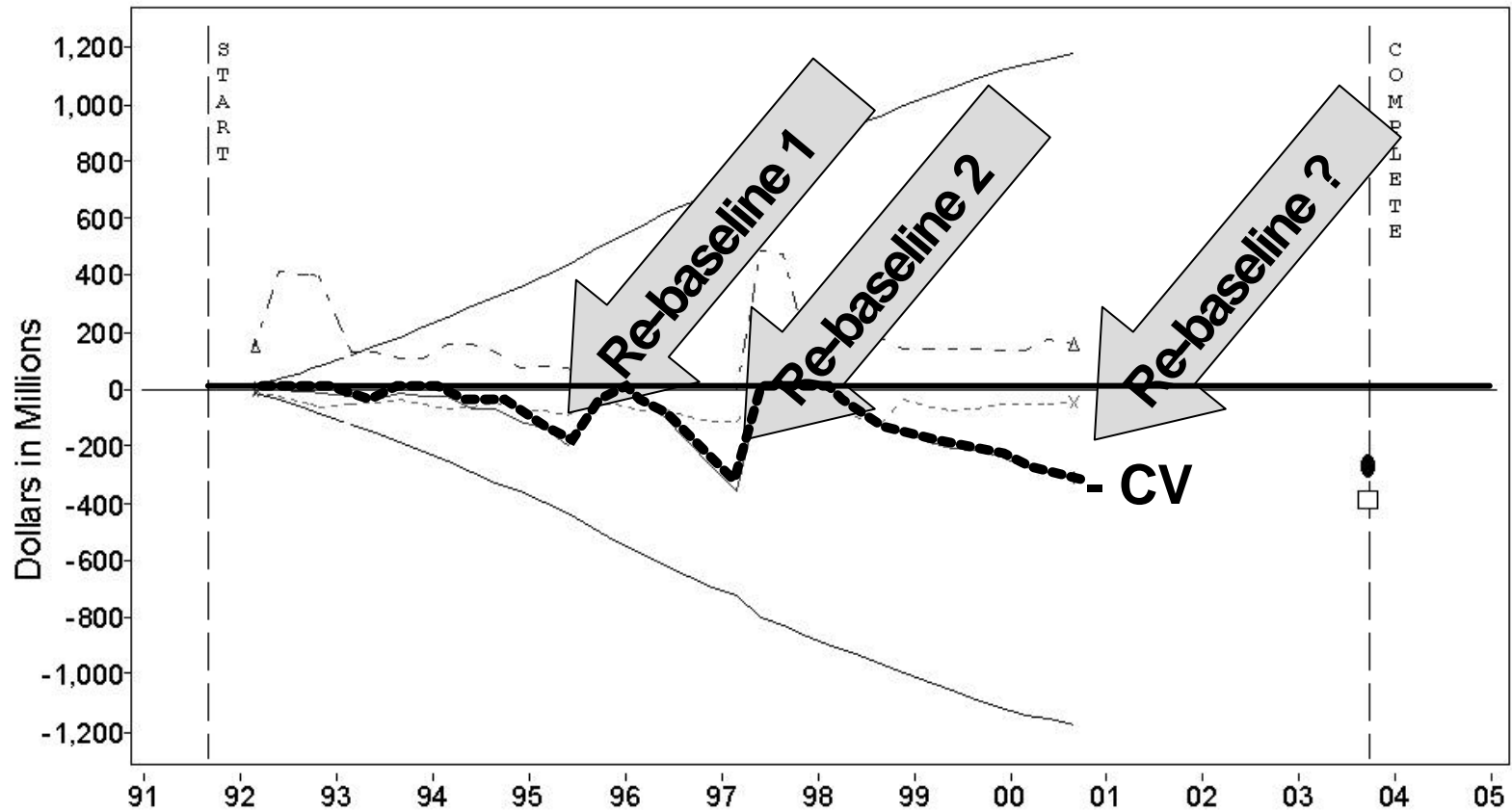
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# COST/SCHEDULE VARIANCE TRENDS

## Aircraft: Variances



Cost Variance	—+—	-313.6	10% Thresholds	— — —	Cost Var @ Completion
Sched Variance	---x---	-46.8	Start/Comp Date	———	PM □ -397.1
Mgmt Reserve	- - Δ - -	162.3			CONTR ● -264.7

## **What happens without Re-baseline?**

---

**“... management systems were closely aligned with . . . C/SCSC compliance; they could not be reset without contractual relief. Without a reset, large variances occurred between existing contractual requirements and actual plans. The system could not handle such variances, and ad hoc systems began to evolve . . . ad hoc systems could not keep pace and disconnects resulted, significantly impacting the Production Plan.”**

**- CEO to USD(A&T) June, 1993**

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**- CEO to USD(A&T) June, 1993**

# Whose Management System?

---

- **Contractor's Management System**
  - **Need to Manage the Contract Effort is Paramount to All other Considerations!**
  - **Contractor must have the Ability to Use its Own Management Systems!**
- **EVMS is not:**
  - **A Government System**
  - **Reporting System**
  - **Contract Administration**
  - **Accounting**
  - **Cost Analysis**
  - **A Method of Punishment**



## **The Re-baseline Dilemma**

---

- **Failure to Re-baseline leads to:**
  - **Two Sets of Books**
  - **Loss of Control**

***BUT***

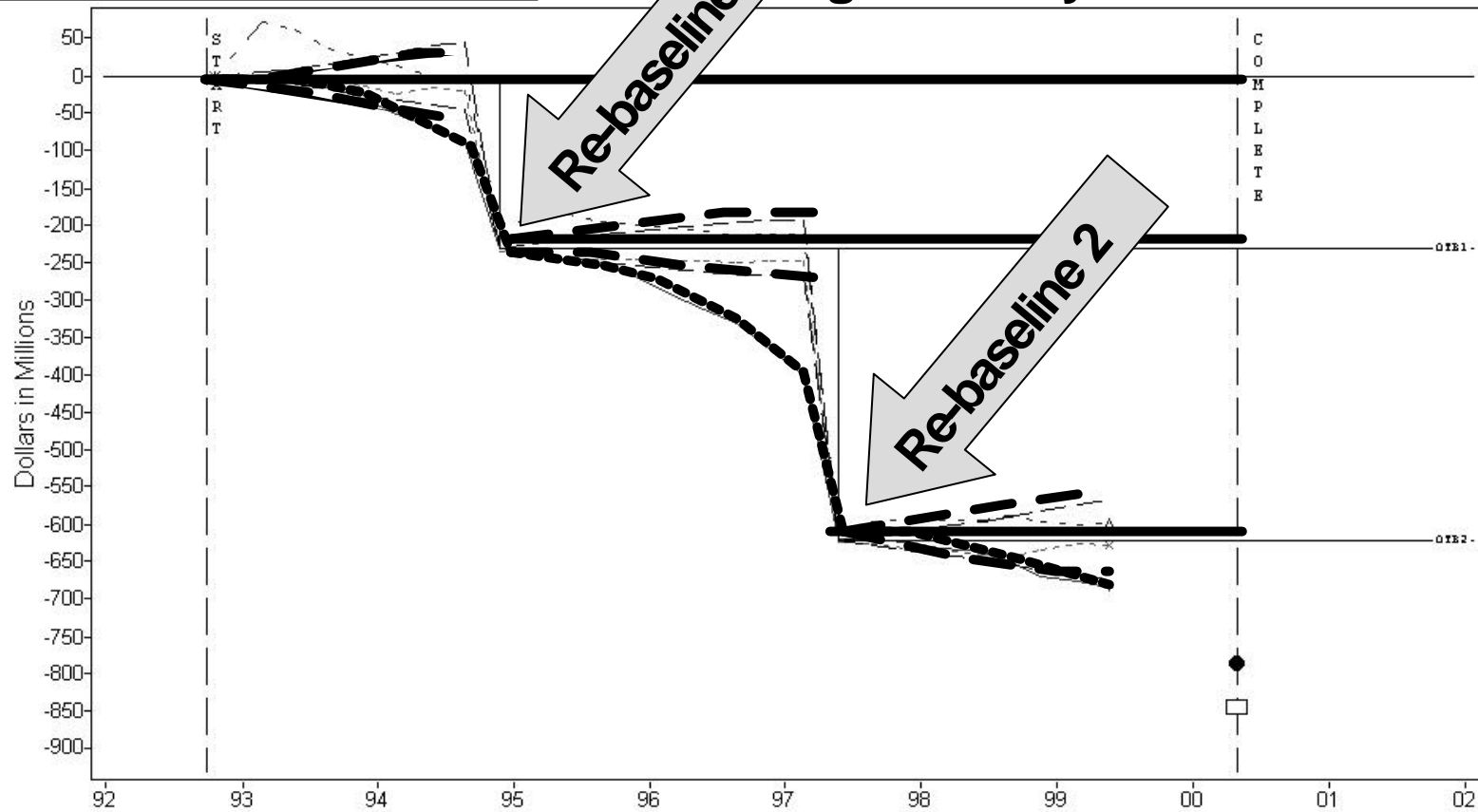
- **Re-baseline without Discipline leads to:**
  - **Rubber Baseline**
  - **Loss of Control**

***And***

- **Re-baseline does NOT change a Contract from “Red” to “Green”!!**

# COST/SCHEDULE VARIANCE TRENDS

Regain Control  
Without Losing Visibility



Cost Variance	— + —	-64.4	10% Thresholds	— — —	Cost Var @ Completion
Sched Variance	- - - x - - -	-6.6	Start/Comp Date	— — —	PM □ -846.4
Mgmt Reserve	- - - Δ - - -	23.2			CONTR ● -787.9



## **Myths of EVM**

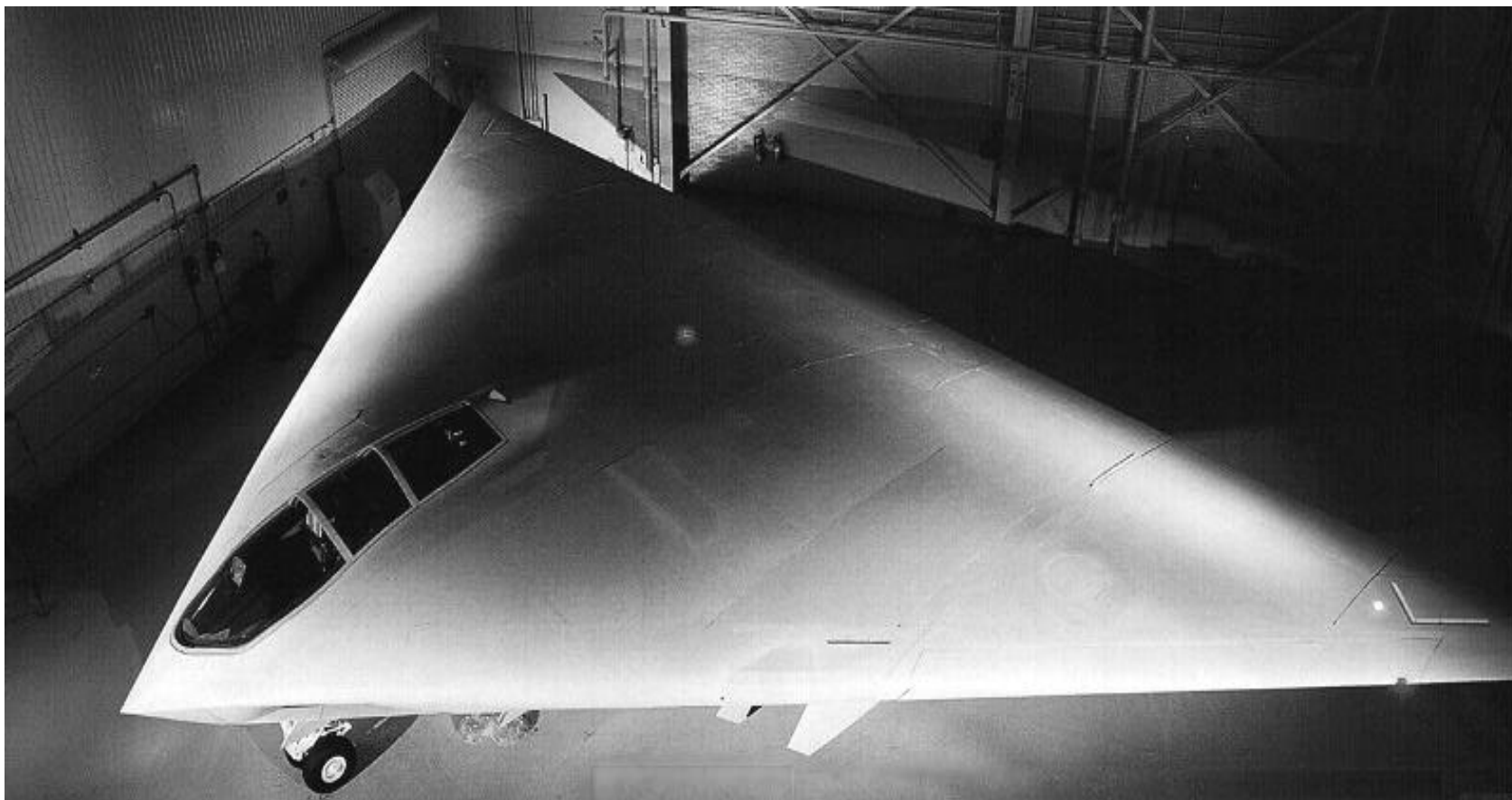
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# **A-12**

## **The Plane That Never Was**

---



## A-12: The Human Cost

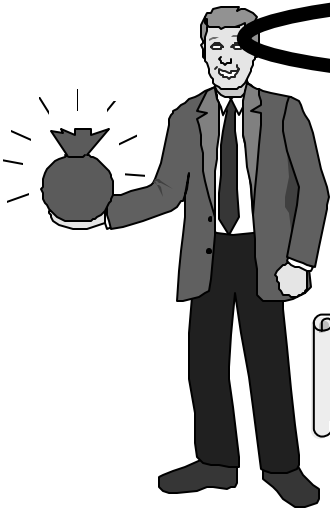
---

<u>Position/Person</u>	<u>Action</u>
USD(A)	Resigned
COMNAVAIR	Early Retirement
PEO	Censured; Reassigned
Program Manager	Censured; Reassigned
McAir Program Manager	Reassigned
GDFW Program Manager	Reassigned

## C&L/TASC Cost Drivers: Cost Without a Requirement

---

- C/SCS Cost Premium is 0.9%
  - Nearly 75% is in Engineering/Program Mgmt.
  - Written Control Account Variances
  - Most of Remainder is in Administrative and External Reporting Activities



Management does cost \$\$

Misuse of EVMS cost more \$\$

Coopers & Lybrand/TASC Study:  
“The DoD Regulatory Cost Premium: A Quantitative Assessment”  
December, 1994

## **Cost As the Independent Variable PM Balancing Act**

---

**Produce the  
Best Product  
within the  
Cost Constraint**

Variances  
are  
Good  
if not covered up.

**Must be willing to  
Trade Requirements  
for  
Overall Cost**

**EVM Implements CAIV**

**COST**

**SCHEDULE**

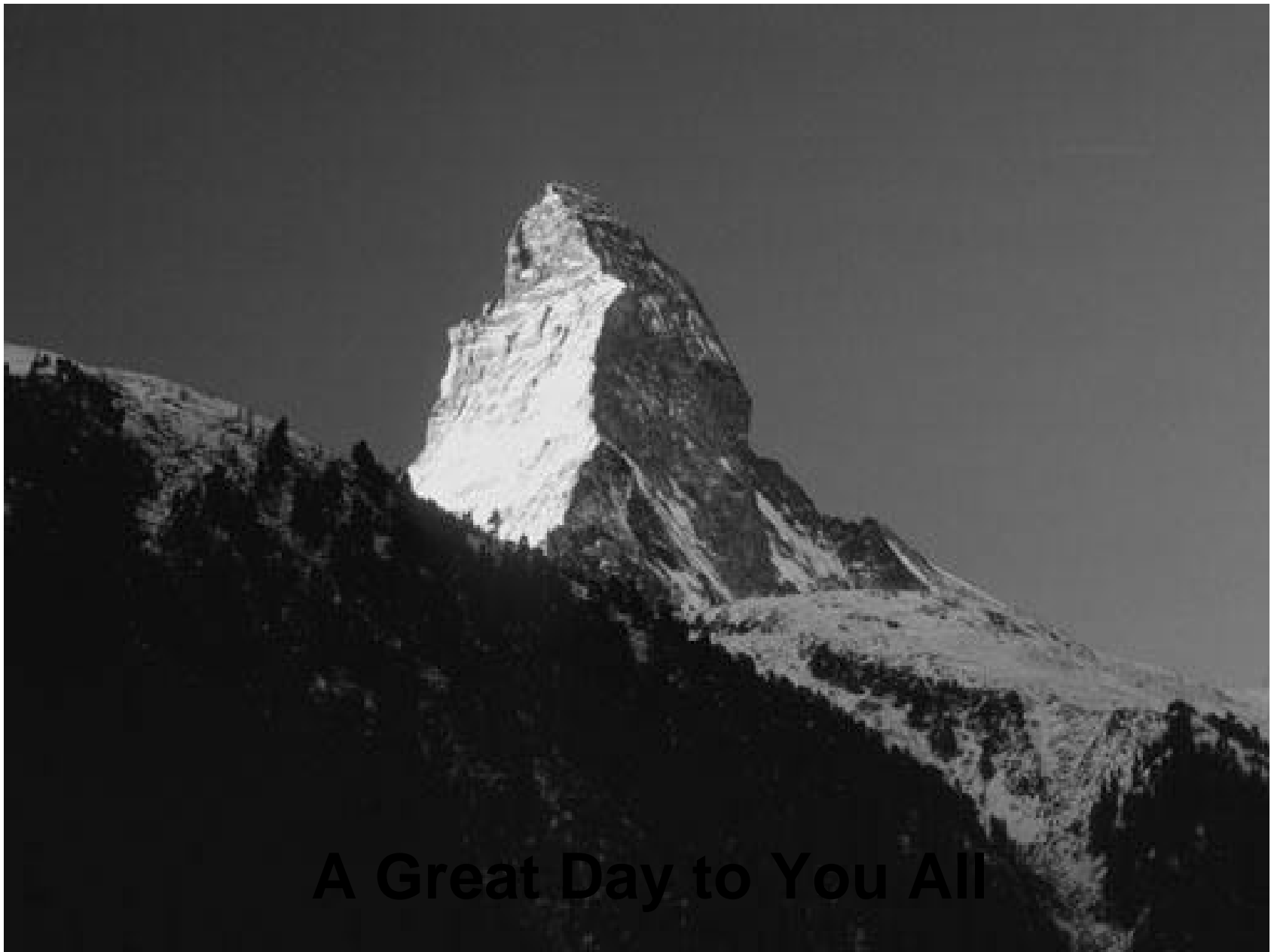
**TECHNICAL  
PERFORMANCE**

**If the CAIV Thresholds have not been met,  
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# Defense Acquisition University



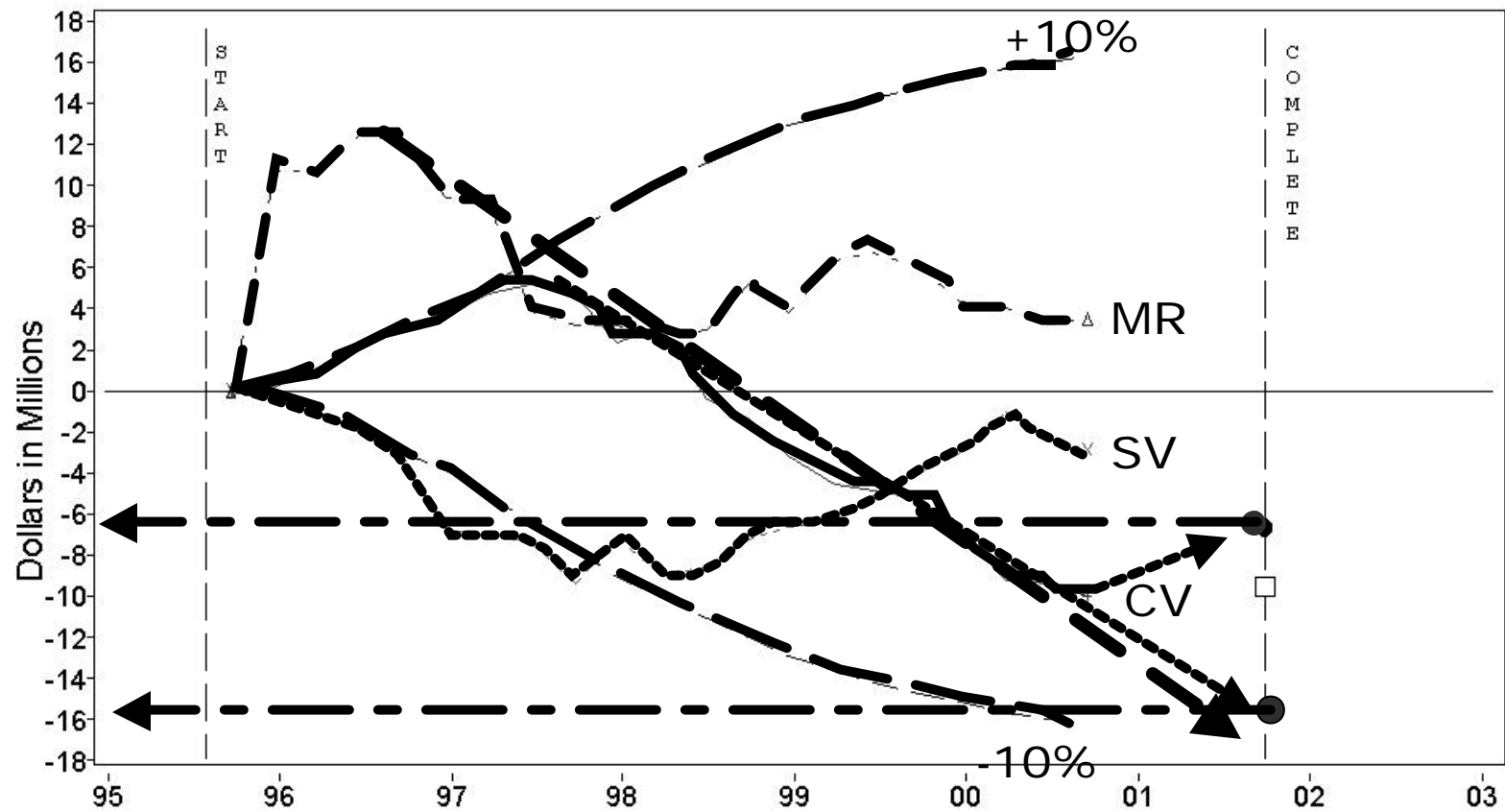
**Education  
for the  
Acquisition  
Professional**



**A Great Day to You All**

# COST/SCHEDULE VARIANCE TRENDS

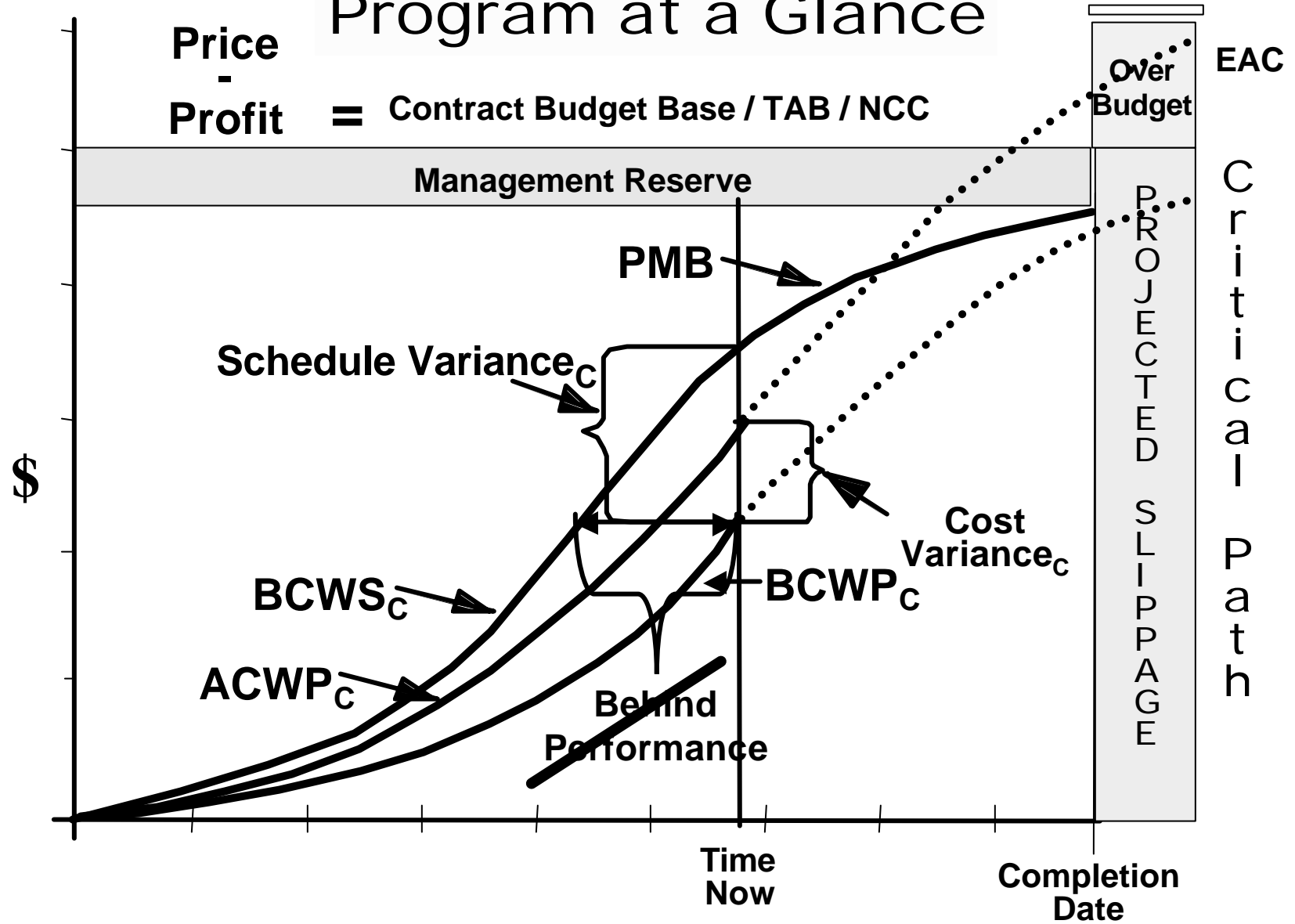
## Missile: Variances



Cost Variance	—+—	-10.0	10% Thresholds	— — —	Cost Var @ Completion
Sched Variance	---x---	-2.8	Start/Comp Date	— — —	PM □ -9.6
Mgmt Reserve	--Δ--	3.5			CONTR ● -6.7

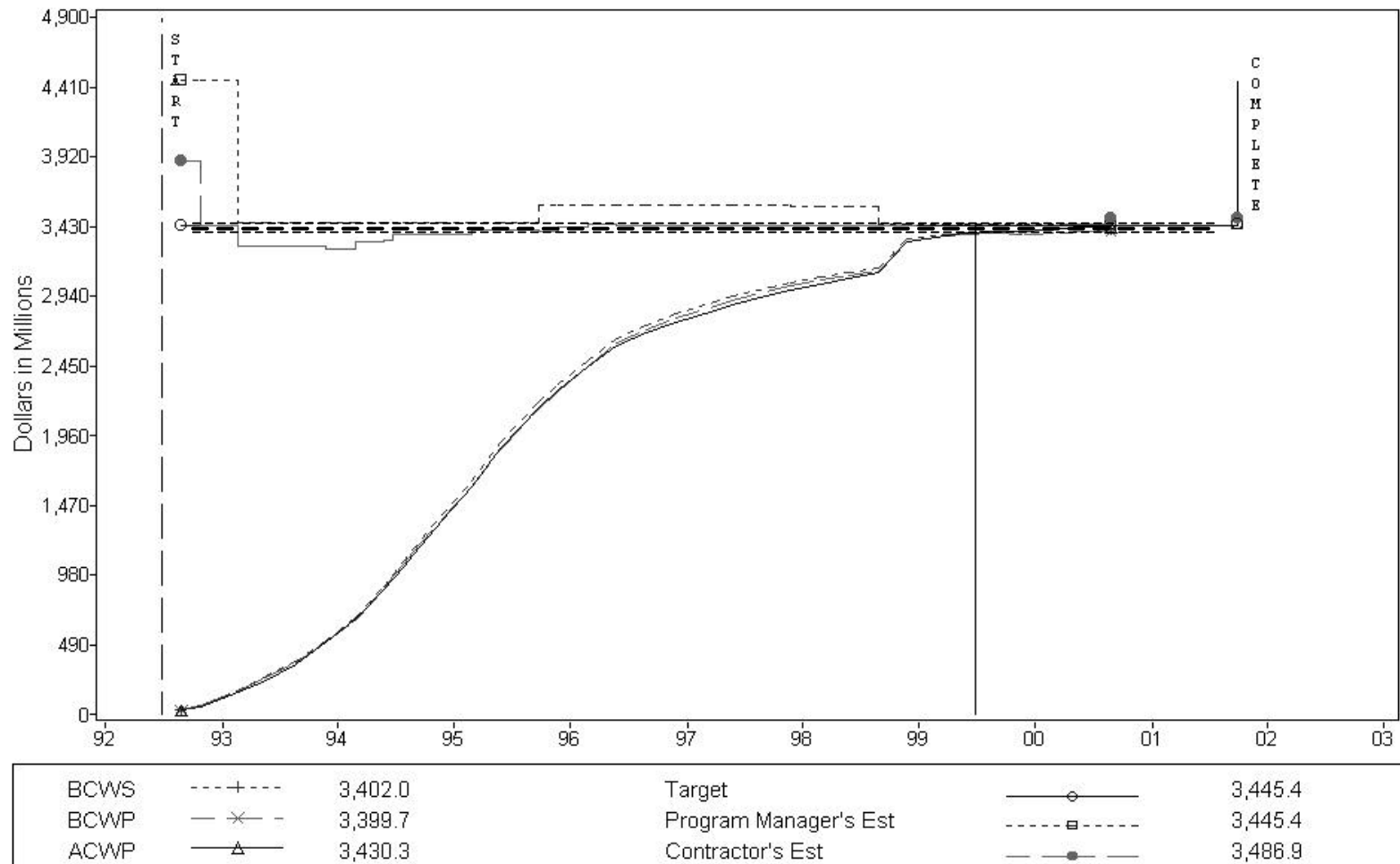


# Program at a Glance



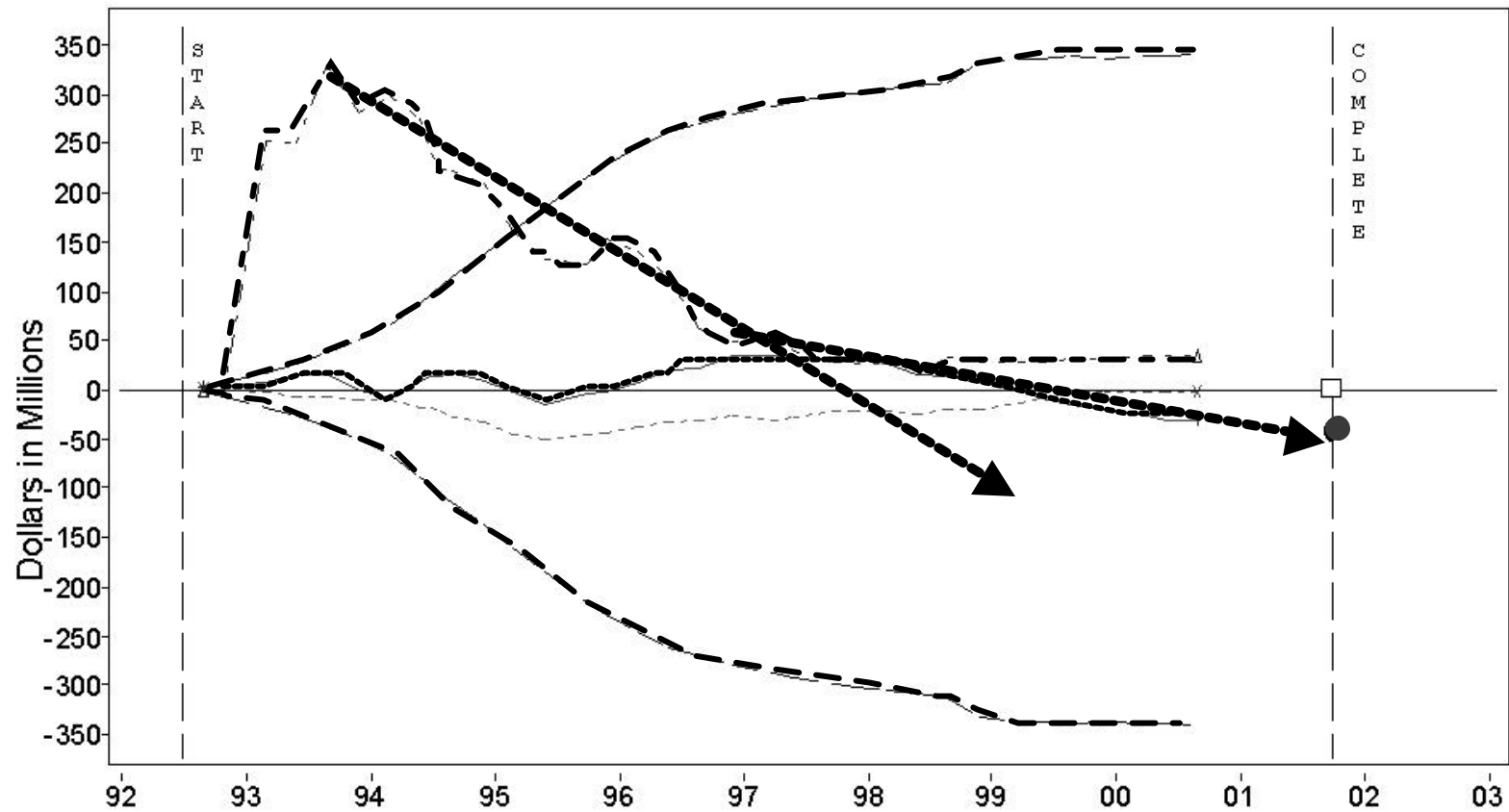
CONTRACT PERFORMANCE

Airplane: PMB



# COST/SCHEDULE VARIANCE TRENDS

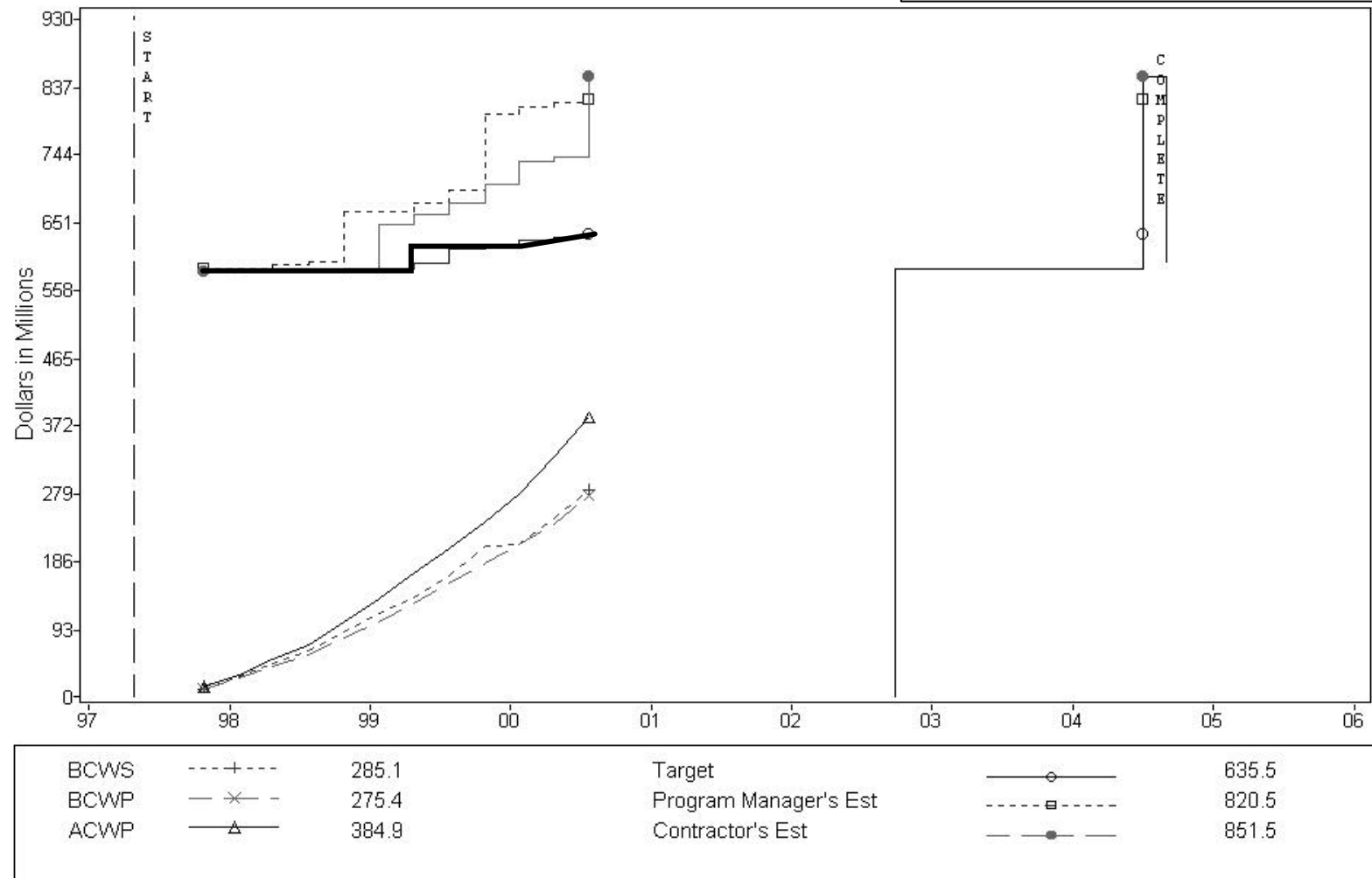
## Airplane: Variance



Cost Variance	—+—	-30.6	10% Thresholds	— — —	Cost Var @ Completion
Sched Variance	---x---	-2.3	Start/Comp Date	— — —	PM □ 0.0
Mgmt Reserve	--△--	34.5			CONTR ● -41.5

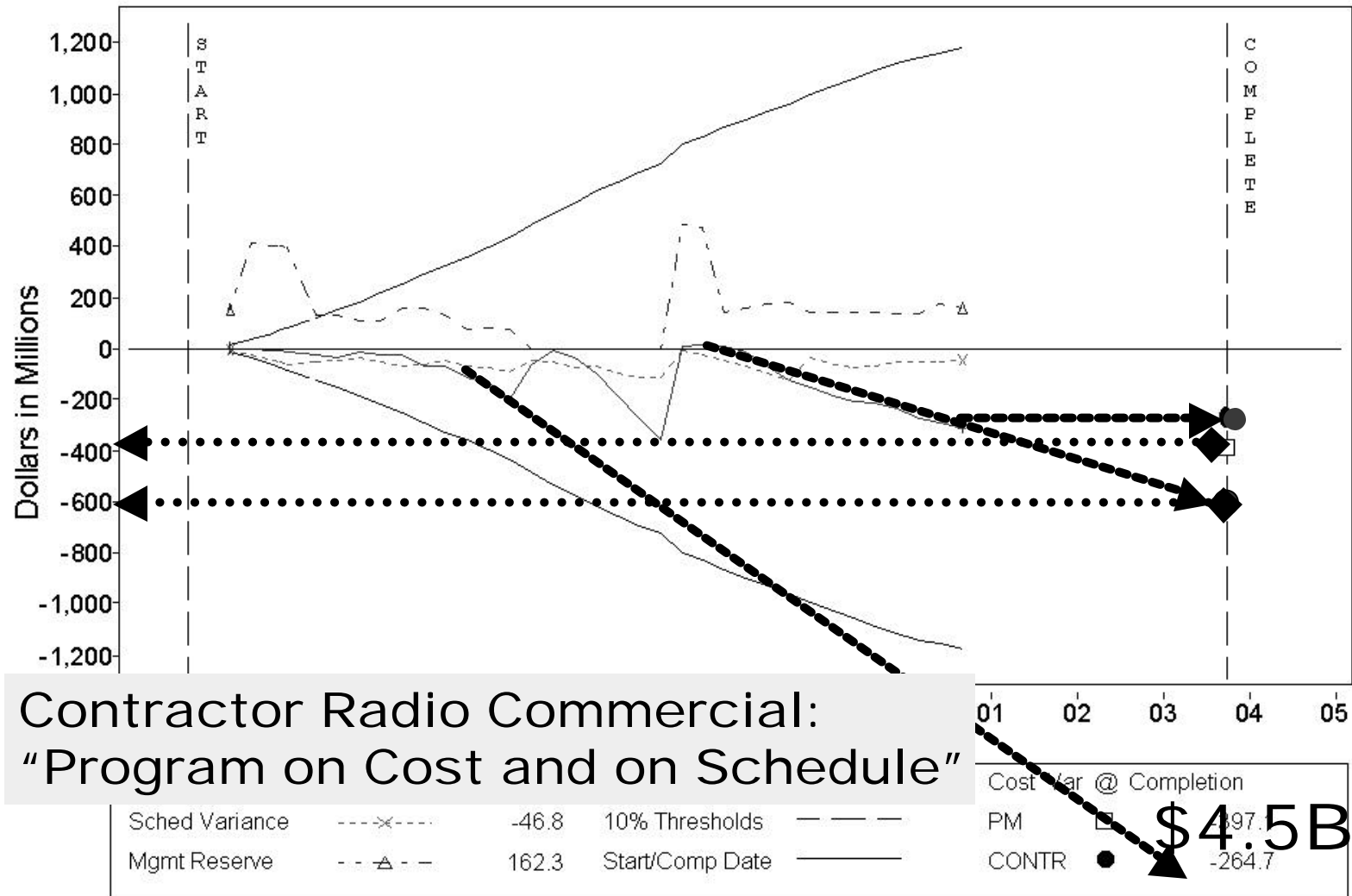
# CONTRACT PERFORMANCE

## Ship: PMB



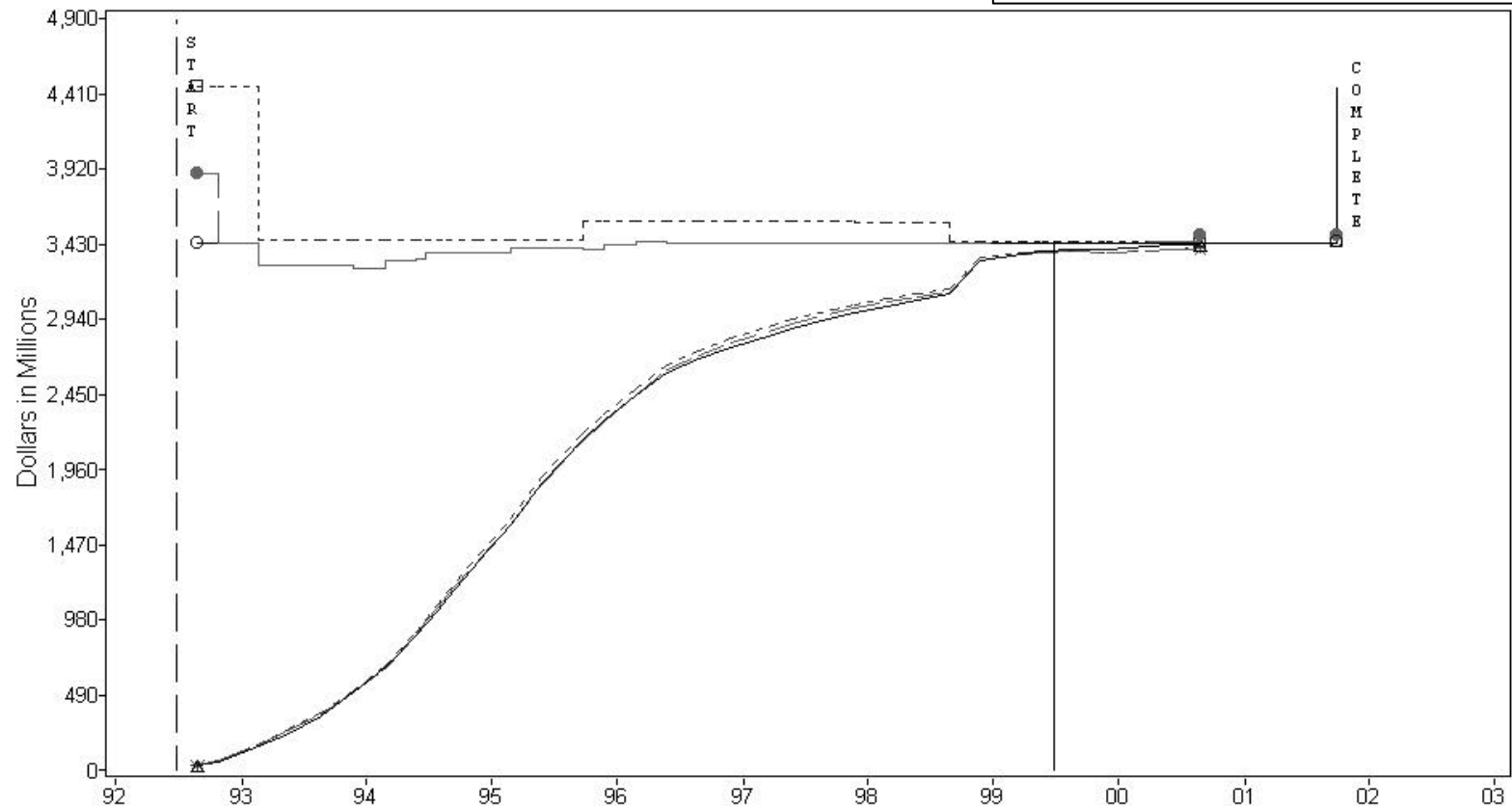
# COST/SCHEDULE VARIANCE TRENDS

## Aircraft: Variances



# CONTRACT PERFORMANCE

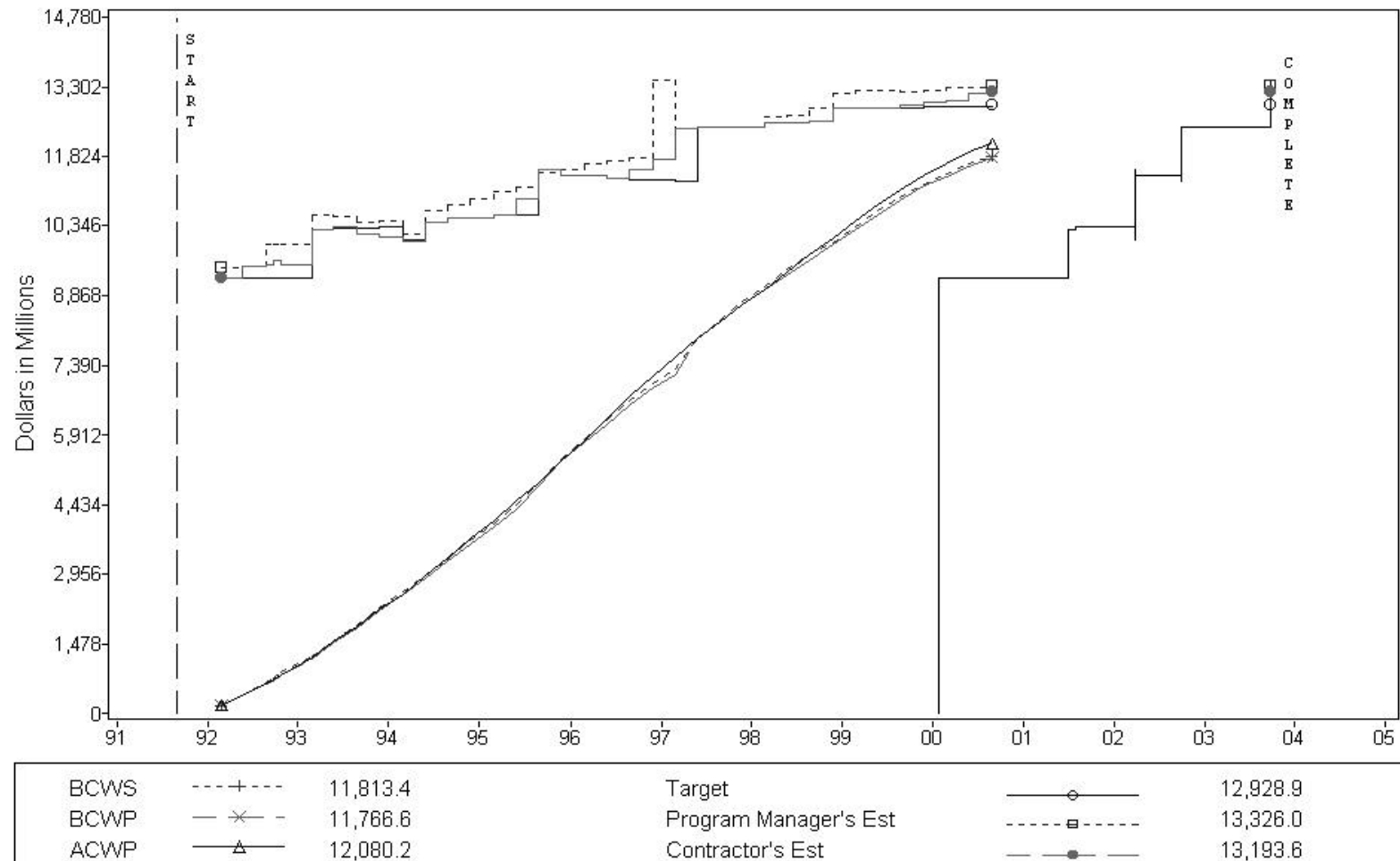
## Airplane: PMB



BCWS	---+---	3,402.0	Target	—○—	3,445.4
BCWP	—x—	3,399.7	Program Manager's Est	---□---	3,445.4
ACWP	—△—	3,430.3	Contractor's Est	—●—	3,486.9

# CONTRACT PERFORMANCE

## Aircraft: PMB



## **OTB Approval A Management Decision**

---

- **Need to Manage the contract effort is Paramount to All other Considerations!**
- **Three Conditions:**
  - **Problem is Understood**
  - **New Plan is Ready**
  - **Contractor needs OTB to effect Proper Management Control**
- **Issue goes to the Heart of EVMS Ownership and Reform**



## **What Does the Data Really Mean ?**

---

- "In summary, the PM underestimated the cost implications of adverse engineering and manufacturing process data...." p.12**
- "The PM testified that when he noted that the contract was funded to ceiling, all interest in FSD cost evaporated." p.23**
- "The CAIG cost analyst...memo concludes: 'The A-12 FSD contract is a fixed price incentive contract, and the Navy has budgeted to its ceiling, so the government's liability is covered'." p.25**
- "...it is apparent that MAR participants at the working group level did not share a clear vision of the relationship between cost and schedule risk and the contractor team's ability or willingness to perform within the FSD contract." p.28**

## Roadmap - Requirement to Competitive Advantage

---

- **Common Business Processes are at the Core of EVM**
  - Suppliers are Realizing Savings, Efficiencies
  - Management Systems are a Competitive Advantage
- **“Good Management Effect”**
  - LM study: Relationship Between Effective Management Practices and Desired Results such as Re-win Rate, Good CPARS and Award Fee Ratings and Higher Return on Sales

***Program by program application isn't good enough***